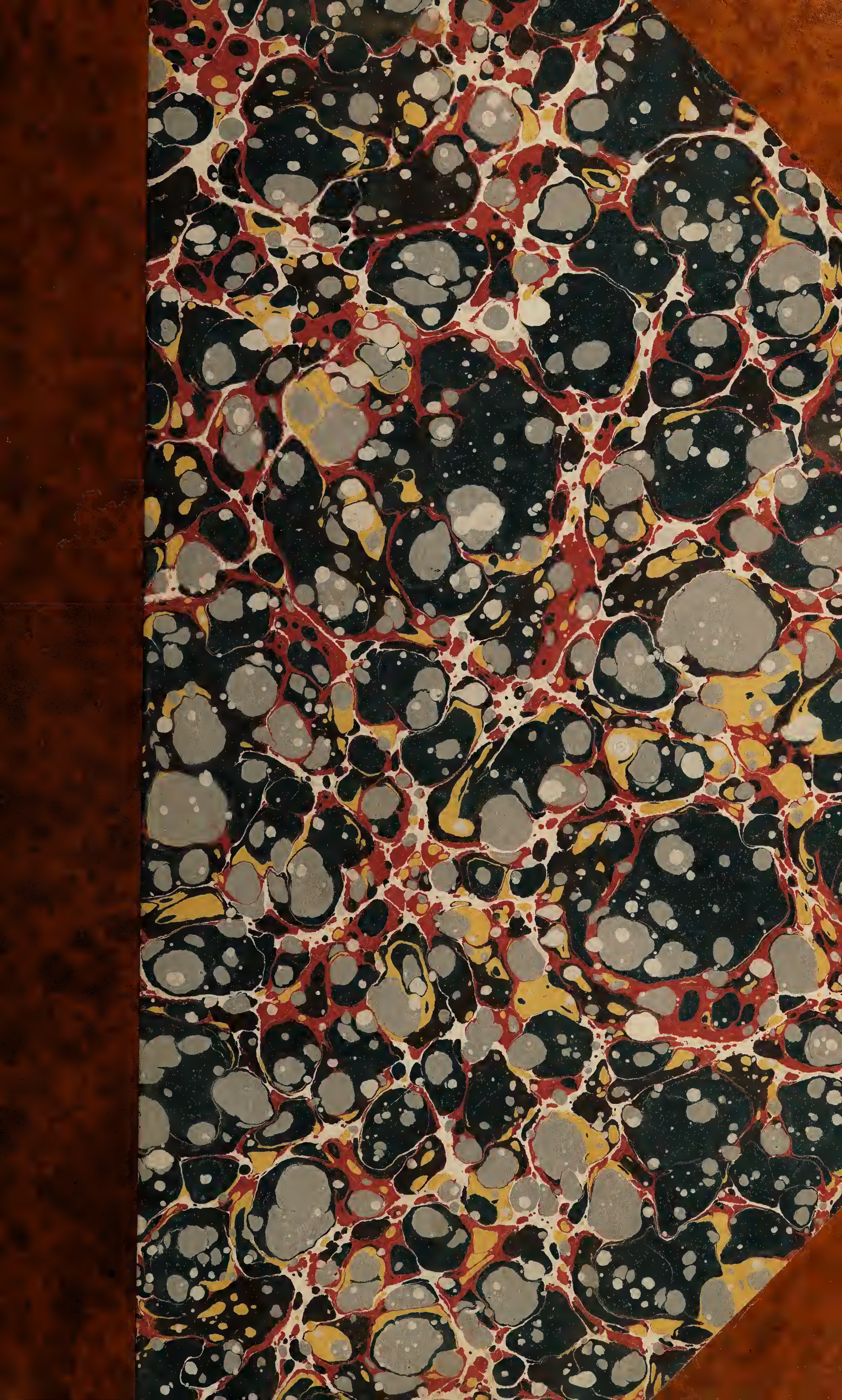

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TREATISE
ON THE
POWERS
OF
MEDICINES.

BOOKS *printed for* J. HODGES.

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John Chetwode

A
TREATISE
ON THE
POWERS
OF
MEDICINES,

By the late Learned

Herman Boerhaave,

Doctor of Philoſophy and Phyſic,

AND

Profeſſor of Phyſic, Botany, and Chemiſtry in the Univerſity of *Leyden*.

Tranſlated from the moſt correct *Latin* Edition,

By *JOHN MARTYN*,

Fellow of the *Royal Society*.

AND

Profeſſor of Botany in the Univerſity of *Cambridge*

LONDON:

Printed for JOHN WILCOX, at *Virgil's-Head*, oppoſite
the *New-Church*, in the *Strand*, and JAMES HODGES,
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THE

PREFACE.

I NEED not trouble the Reader with an account of the AUTHOR of the enſuing Treatiſe. His extraordinary Abilities in every part of phyſical knowledge, are ſo well known, that it will be a ſufficient recommendation of this Work, to inform the Public that it was dictated by the learned BOERHAAVE. Treatiſes on the MATERIA MEDICA are ſufficiently numerous. They are generally filled with the names and reputed virtues of a great variety of Medicines: and theſe are handed from one to another, without ever making a ſtrict and ſcrupulous inquiry into the foundation on which theſe characters are built. Hence the Practice of Phyſic has been embaraſſed with a vaſt croud of inſignificant trifles, which have been recommended from age to age, on no better authority than the dreams of old Women, or the idle fancies of ignorant Monks.

But our Author has trodden in a far different path: and has not aſcribed any virtues to the Medicines which he has mentioned without their being warranted by a juſt mechanical reaſoning. He begins with explaining the Elements of all Bodies, and the Nature of both Solids and Fluids; he then proceeds to ſhew the ſtructure of a Human Body in health, and the ſtate of one that is diſeaſed. Then he conſiders the Solids and Fluids of our Bodies in general, and the nature of our Veſſels; in which the Reader will find, with no leſs ſurprize than pleaſure, into what minute parts our Veſſels are almoſt infinitely divided and ſub-divided. Then follows the conſideration of Acrid and Viſcid Particles, the nature of our Fluids, eſpecially of the Blood, the faults of the whole maſs of Fluids conſidered together, the Gravity of the Blood and the Projectile Motion. Having laid this ſolid foundation, he then comes to ſpeak of Medicines in general, where he ſhews the inſufficiency of the diſtribution made by Galen, and proves that the moſt natural way of dividing Medicines is into thoſe which act on the *Solids*, thoſe which act on the *Fluids*, and thoſe which act on both *Solids* and *Fluids* together.

That the Reader may have a clearer knowledge of the Method which the learned Boerhaave has uſed in the claſſing of Medicines,

dicines, I have thought proper to draw his whole method into the following SYNOPTICAL TABLE.

The Operation of the Medicines is on the

- *SOLIDS*, and theſe are either
  - *Stimulating*
  - *Contracting*
  - *Relaxing*
  - *Conſtipating*, under which are contained,
    - *Emplaſtics*,
    - *Illinents*,
    - *Obſtruents*,
  - *Specific Chirurgical*, ſuch as
    - *Sarcotics*, and
    - *Cicatriſers*.
  - *Solvents*, which are ſub-divided into
    - *Reddeners*,
    - *Veſicatories*,
    - *Eſcharotics*,
    - *Corroders*,
    - *Cauſtics*,
    - *Putrefiers*,

- *FLUIDS*, and theſe are either,
  - *Attenuants*,
  - *Condenſants*, or *Incraſſants*,
  - *Cauſers of Acrimony*,
  - *Demulcents*,
  - *Immutants*,
  - *Diluents*,
  - *Coagulaters*,
  - *Movers*,
  - *Siſtents*.

SOLIDS and *FLUIDS*; and theſe divided into five Claſſes.

- I. Of Medicines promoting ſome peculiar Secretion: theſe are,
    - *Generaters of Milk,*
    - *Generaters of Seed.*
- II. Of Medicines promoting Excretions in any part of our Body: theſe are,
    - *Movers of Phlegm,* under which are contained,
        - *Errhines,*
        - *Sialogogues,*
    - *Expectorants,*
    - *Purgatives,* under which head are contain'd
        - *Eccoprotics,* which are either
            - *Lubricaters,*
            - *Diluters,*
            - *Lenitives,*
        - *Phlegmagogues,*
        - *Cholagogues,*
        - *Hydragogues,*
        - *Melanogogues*
    - *Emetics* or *Vomitories,*
    - *Diuretics,*
    - *Sudorifics,*
    - *Diaphoretics,*
    - *Uterines,* under which are contained
        - *Emmenagogues,*
        - *Ariſtolochics,*
        - *Ecbolics.*
- III. Of ſome other Medicines acting on the Solids and Fluids together; theſe are,
    - *Aperients,*
    - *Diſcutients,*
    - *Emollients,*
    - *Aſtringents,*

- *Detergents*,
- *Emundants*,
- *Erodents*,
- *Heaters*,
- *Coolers*,
- *Drawers*,
- *Repellers*,
- *Suppuraters*,
- *Ripeners*.

IV. Of *Topical* Medicines : theſe are;

- *Cephalics*,
- *Ophthalmics*,
- *Odontalgics*,
- *Otalgics*,
- *Stomatics*,
- *Arteriacs*,
- *Thoracics* or *Pulmonics*,
- *Cardiacs* or *Cordials*,
- *Carminatives*,
- *Anthelminthics*,
- *Anodynes* ; which are either
    - *Paregorics*,
    - *Hypnotics*,
    - *Narcotics*,
    - *Nepenthes*.

V. Of *Antidotes*.

THIS method is not indeed ſo perfect as might be wiſhed, nor is the order of the Chapters quite conſiſtent with the diſpoſition made in the Chapter of the Claſſes of Medicines, *page* 87, *& ſeq.* This little inconſiſtency is without doubt owing to ſome inaccuracy of thoſe who have tranſcribed theſe Lectures, which however are upon the whole, far more compleat, than any of the other Pieces, which have been publiſhed without the ſanction of our learned AUTHOR's own name.

THE firſt edition of this Book in *Latin*, and another printed in *Engliſh* were both ſo full of errors, that they were quite unworthy of the great name which was prefixed to them. They were however both received by the Public in ſuch a manner, as ſhews the great regard which is paid to whatſoever may be ſuppoſed to be the Off-ſpring of BOERHAAVE. A learned Phyſician, who had been the Diſciple of this excellent AUTHOR, having ſeen with concern the injury that was done his Maſter, in publiſhing ſuch mutilated and incoherent Diſcourſes under his name, undertook to correct the ſpurious *Latin* Edition, from a more exact Copy, which he had by him in Manuſcript. This corrected Edition was printed at *Paris* in 1727, and is that from which the preſent tranſlation was taken. The Notes were added by the *Latin* Editor, and ſome few, which are diſtinguiſhed by their being incloſed between Crotchets [ ], have been inſerted by the Tranſlator.

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ERRA.

ERRATA.

Page 59.	Line 11.	read	*orifices.*
60.	15.		*efficacious.*
67.	25.		*2.*
92.	1.		*catharteria.*
121.	7.		*particles.*
135.	14, 15.		*abſorb.*
181	in the running title,	read,	*Of Eccoprotics,*
196			*Phlegmagogues.*
209.			*Cholagogues.*
245,	Line 33.	read	*condemns.*
272.	In the running Title,	read	*Emollients.*
288.	Line antepenult.	read	*Pimpernel.*

BOERHAAVE's TREATISE ON THE Power of MEDICINES.

PROLEGOMENA.

CHAP. I.

Of the Elements of Bodies, or of the Nature of Solids and Fluids in general.

1. ELEMENTS of BODIES are defined by Philoſophers, to be *the moſt ſimple corpuſcles of which other Bodies are compoſed, and into which they may again be reſolved:* and thus we underſtand them to mean *the firm original of every Body, and the* Stamina *which by their conjunction conſtitute a Body.*

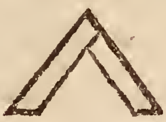
2. IF the coheſion or hardneſs of any Body is ſo great as to exceed all the known power of Motion, then it is called an *Atom*, or *corporeal Element.*

We learn from Natural Philoſophy, that every Body is extended, impenetrable, figurable, moveable, and that all compound Bodies cohere with ſome endeavour, which more or leſs reſiſts a ſeparation; which endeavour is called *hardneſs*: now if that coheſion, endeavour, or *force*, which Newton calls attractive, is ſo great in thoſe *Stamina*, of which Bodies are compoſed, that there is no motion in the nature of things, which is not exceeded by the reſiſtance of the coheſion of theſe *Stamina*, then thoſe Particles are called *Atoms*, from the *Greek* privative Particle α and τομὴ, *diviſion*: hence an *Atom* is properly a part which can be no farther divided, or is indiviſible. Now theſe are the *Atoms*, of which Democritus formerly aſſerted that all Bodies conſiſt; who well knew that there is no Particle in Nature, which is not capable of mathematical diviſion: but what he meant was that if a *force* uniting the parts of a Body is greater than any force which can be impreſſed on the Body, this union or coheſion muſt neceſſarily be inſuperable, as not being to be deſtroyed by any force: whence he gave the name of *Atoms* to any Particles that were ſo conſtituted.

3. It has been queſtioned whether there are any ſuch corpuſcles in Nature? To determine which it muſt be conſidered, firſt, that altho' very many Bodies are changed as to their *Form*, yet none are changed in their *Eſſence*; therefore thoſe which compoſe the *Eſſence* of things, muſt ſo cohere, that there may be no *force* in Nature, which being applied to the Particles conſtituting the *Eſſence* of Bodies, may be able to exceed their coheſion; whence it manifeſtly follows, that this Particle or *Atom* can by no means be changed: for if theſe corpuſcles ſhould begin to be changed, and divided into parts, all Nature muſt go to ruin and be utterly deſtroyed; for inſtance, if

the parts of Water were ſo changeable, as to be capable of becoming parts of Fire, who does not ſee that the whole face of things would be changed, and that all things would be deſtroyed by a ſuperabundance of Fire? Therefore all Nature requires that the *Principles*, of which Bodies conſiſt, ſhould be immutable : for if it had not been ſo, they could not have remained the ſame for ſo many ages; but we ſee that the *Eſſence* of Bodies has never been changed, becauſe the *Stamina* or *Elements* of them, as has been already obſerved, are immutable; not that they cannot be *mathematically* divided, for this may be done infinitely, but that no *force* can ſeparate their parts from each other; and this makes the Stability of Nature. Now the cauſe of this is the very order of Nature, conſtituted by God in ſuch a manner, that the cauſe of coheſion ſhould always be the ſame.

4. If an *Atom*, and a *Body conſiſting of Atoms*, has it's coherent parts ſo united, that there be no empty Space between them, then that *Atom*, and that Body will be called a *perfect Solid.* But a *Solid is a Body, whoſe parts cohere in ſuch a manner, that, one part being moved, the reſt are compelled to be moved alſo at the ſame time.*

It has been a queſtion long controverted amongſt the Learned, what Idea ought to be given of a *Solid?* All the Peripateticks and the Carteſians ſay, that *Extenſion is the Idea of a Solid*; but it may eaſily be ſhewn, that it is not ſo to be underſtood. For we have ſaid that an *Atom* conſiſts of other parts cohering ſo cloſely, that they cannot be ſeparated ; but that *Atom* will not yet be a *perfect Solid*, unleſs ſomething farther be added to this definition ; for if God had joined two *ſolid* Particles together after this manner,  both theſe Particles had been ſo joined indeed, as to make one *Atom*, whoſe parts where they touch would cohere ſo cloſely, that no *force* could ſeparate them; but yet it would not be a *perfectly ſolid Atom*, becauſe there would be a *Space* between both the parts of it: but if they had been ſo united, as to leave no intermediate *Void*, as thus, then that *Atom* would have been *perfectly ſolid*, as having no *Space* in it, where another Body could be received and contained. Hence therefore, *a perfectly ſolid Body is that, which conſiſts of Atoms or indiviſible Particles, joined in ſuch a manner as to have no Void between them.* There is yet another ſort of *perfectly ſolid* Body, which is compoſed of the *perfect Solids* already mentioned, without any Space alſo between the parts which conſtitute the whole: and if to theſe two ſorts of *perfect Solids* we add the *Atom*, which conſiſts of mutually united parts, without any intermediate Space, then we ſhall have three ſorts of *perfectly ſolid* Bodies.

5. Now if any one ſhould aſk, how we are able to meaſure a *perfectly* ſolid Body? we anſwer, *by the meaſure of the Space.* Let us ſuppoſe, for inſtance, that we had a *Space*, which is exactly one cubic Foot; and that this Space is afterwards filled by a Body exactly of the ſame bulk and figure, that is, of one cubic Foot, without any *Void* at all in it, and therefore a *perfectly ſolid Body*: now therefore, ſince this Body exactly fills that *Space*, the meaſure of it will alſo be the meaſure of the Space in which it is contained; for there will be juſt ſuch a quantity of impenetrable *Matter*, as there is of *Space*.

6. If an *Atom*, or *a Body compoſed of Atoms*, has it's impenetrable parts joined in ſuch a manner, as to leave *little empty Spaces*, or ſuch as are not filled with other united Matter, between the connected Parts, then it is called a *porous* Body.

7. Now in order to know the meaſure of a *porous* Body, let us ſuppoſe for inſtance, that a *perfectly ſolid* maſs of Gold occupies the *Space* of one cubic Foot, and then that the Gold, the meaſure of which according to the hypotheſis is the capacity of that cubic Foot, is taken away, and that ſo much Water is put in it's room, as will exactly fill the *Space*; then if two third parts of this Water are *pores*, one third Part of the cubic Foot will be the meaſure of the corporeal ſubſtance of that Water: for the remainder will be eſteemed as ſo much *void Space*, and not Body, with regard to *perfectly ſolid* Matter. This is of great ſervice in tracing out the *Powers* of Bodies; for the *Powers* are found out by the *quantity* of Matter, and this *quantity* is known by the number and magnitude of the *Pores*; becauſe they are to be ſubtracted from the reſt of the corporeal bulk; as conducing nothing to the *Powers* of Bodies, becauſe they are only *empty Spaces*: but that alone gives the quantity of Matter contained in it, which fills a *Space* excluſive of the *Pores*: this therefore is the meaſure of *Corporeity*.

8. Hence we ſee that, if the aſſertion of Aristotle and Des Cartes was true, that *Extenſion is the Idea of a Solid*, it would follow that corporeal ſubſtance is every where the ſame: and this would be true indeed if there was no ſuch thing in Nature as a *Vacuum* or *Void*; for then Water and Gold would be equally heavy, and have equal powers, as being equally *perfect Solids*, but the great Newton has evidently ſhewn this to be falſe by the moſt evident mathematical demonſtrations, in his Experiments concerning *Pendulums*. We have ſeen already that an *Atom* may be *perfectly ſolid*, and *imperfectly ſolid*, or *porous*; and therefore that Bodies compoſed of them might be both perfectly *ſolid* and *porous*; and that Bodies may be called *porous* in two

ſenſes, namely *ſimply porous*, when nothing is contained in the Pores, and *porous* with internal Matter fluctuating in the Pores; when, as we ſaid, they have only Pores, or penetrable *Spaces*, not filled up, that is, are *philoſophical Vacuums*. Hence alſo it has appeared, that when we would meaſure Bodies according to their Powers, not Geometrically but Phyſically, we muſt diſtinguiſh between *Moles* or *Bulk* and *corporeal Maſs*: for *Bulk* is the whole Extenſion of a Body, which in ſome places may be *perfectly ſolid*, in others *void*. Whence it follows, that if a Body is *perfectly ſolid*, the meaſure of it's *Bulk*, and of the *Space* in which it is contained, is the meaſure of it's *Subſtance*; but if there are *void* places in the *Bulk*, that then the meaſure muſt be taken by ſubtracting the *Voids*: which will appear more clearly from what is to follow.

Of the Specific Weight of Bodies.

1. THOSE two great Men NEWTON and HUYGENS, have both diſcovered by different ways of reaſoning, that *the corporeal Matter found in any Space is in proportion to the weight of the Bulk*. Which Propoſition is no leſs uſeful than elegant, in *mechanically* diſcovering the *Powers* of Bodies. I have already explained, what is meant by the Bulk or Maſs of a Body, and what by Quantity or corporeal Subſtance. Now Sir ISAAC NEWTON has diſcovered that what is received between the *Pores*, and does not cohere, adds nothing to the *force* of a Body, but is juſt as if it was *void*, with regard to the acting *Powers*; which he clearly deduces from Experiments about *Pendulums*. See the beginning of his learned Treatiſe *de Principiis Mathematicis Philoſophiæ Naturalis*, and alſo the third Part, where he mentions the Experiments concerning a *Box*, weighed *full*

and *empty.* Conſult HUYGENS alſo concerning this *Propoſition* in his Treatiſe *de la Lumiere, & de la Peſanteur.* Now what theſe two great Men have founded on their Experiments, I ſhall aſſume for a Principle; that *the Forces or Powers of Bodies are as their Weights:* for if in one Body, the reſt being equal, the *Forces* are double, there will be alſo double the quantity of impenetrable *Matter* in it.

2. THIS being ſuppoſed, we may know the quantity of true impenetrable Subſtance contained in a certain place, by weighing the Bulk, as was ſaid before; but we do not yet know exactly how this is, becauſe we are not acquainted with any *perfect Solid*; for if we had any ſuch *Solid*, we might alſo know the *Powers* of Bodies, ſo far as they depend thereon: therefore *Weight* is only a relative knowledge with regard to us. But if we could know exactly that Gold contained preciſely ſuch a quantity of *perfectly ſolid* Matter, then we ſhould alſo weigh a cubic Foot of Water, whence we ſhould immediately know that, as Water has ſo much leſs *Weight* than Gold, there muſt therefore be ſo much more *Void* in it; and ſo of other Natural Bodies; and thus a true general doctrine of Hydroſtaticks, as well as of Mechanicks, might be formed.

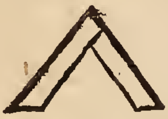
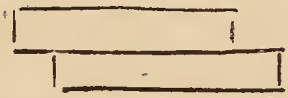
Of the Difference of Bodies.

1. WE have already aſſumed as *Phyſical Principles* that Matter is extended, impenetrable, figurable, and infinitely diviſible, as it conſiſts of infinite *nothings* in a manner, which cohere by a certain *force*, and are called *Atoms*; and that all theſe divided Particles have a certain gravity which perfectly agrees with the whole Maſs, or Aggregate of *Atoms:* hence therefore it follows that ſome of theſe properties may be different in Bodies. Now therefore we ſay

that *the difference of a Body ariſes from the Idea of it's Nature*, which difference is threefold.

2. The firſt difference ariſes from the difference of the *Atom* it's ſelf: for, 1. One *Atom* is not always of the ſame bigneſs with another, ſeeing this is not neceſſary to conſtitute a Body; 2. One *Atom* may be more or leſs *ſolid* than another; ſeeing one may be *perfectly ſolid*, and another, tho' compoſed of indiviſible Particles, may have *Voids* in it, as was ſhewn before; 3. One *Atom* may differ from another both in ſize and figure.

3. The ſecond Variety conſiſts in this, that one *Atom* may be united after a different manner with another, and one Body compoſed of *aggregated Atoms* with another like it, by a greater or leſs degree of coheſion: and this coheſion cannot be deduced from *elemented* things, for they have an eſſential property not depending on external cauſes.

4. The third difference ariſes from the various manner of uniting one *Atom* with another, and one Body compoſed of *Atoms* with another like it; for example, two *Atoms* may be united after this manner,  and thus,  and ſo leave more or leſs *Space* between their parts, &c. Hence ariſes the difference of *Poroſity* and *Denſity*, as we have ſeen already.

5. Now therefore from what has been ſaid it appears, that in conſidering the Nature of *corporeal Elements*, the Natural Philoſopher, and therefore the Phyſician, ought to be a perfect maſter of theſe *nine heads*, which are fundamental and neceſſary to be known.

1. The *Extenſion* of a *Body*.
2. It's *Diviſibility*.
3. It's *Impenetrability*.

4. It's *Hardneſs*, or greater or leſs coheſion of it's conſtituent parts.

5. The *Nature* of an *Atom*, or *Molecula*, which is indiviſible by any force.

6. Absolute *Solidity* and *Denſity*.

7. Porosity and *Rarity*.

8. The *Meaſuring* of a *Perfect* or *Imperfect Solid*.

9. The *Difference of Bodies*, which is threefold, and is deduced from the doctrine of *Elements*.

These are true phyſical Principles, and derived from the nature of things. But having now conſidered *ſolid* Bodies in general, it remains that I ſhould ſay ſomething concerning the nature of *Fluids*.

Of the nature of Fluids.

1. *A Fluid is that whole congeries of Bodies, whoſe Moleculæ are moſt minute, and eſcape the ſenſe, and cohere with an eaſily mutable endeavour, and therefore give way to the ſlighteſt touch, and ruſh againſt each other.* The definition of a *Solid*, or as Celsus calls it, a *Conſiſtent*, being that it does not eaſily ſuffer it's conſtituent parts to be ſeparated, and that, when any force is impreſſed on it, it ſuffers it's whole bulk to be moved, rather than that part to be ſeparated on which the force is impreſſed. Hence the definition of a *Fluid* is exactly the contrary, denying what was affirmed in the other.

2. But every part of a *Fluid* is one *Body*, for that part which coheres very little or not at all with another, is *one* part; therefore what was ſaid before of *one* Body with regard to *Solids*, is true alſo with regard to thoſe Bodies which conſtitute *Fluids*; and therefore thoſe general premiſes may be here again admitted.

3. But we alſo conſider three things in theſe *Moleculæ* as they compoſe a *Fluid*: 1. The *different*

bulk of the parts; for one *Fluid* has greater or ſmaller parts than another: 2. The *various figure*; for the parts of one *Fluid* are differently figured from thoſe of another: 3. The *diſſimilar coheſion* or *endeavour*; for the parts of one *Fluid* cohere with a greater or leſs endeavour than thoſe of another.

4. On theſe *three* different heads depends all the variety of *Fluids*: for hence a *thin Fluid* is that whoſe parts are the ſmalleſt, and ſcarce cohere; and a *viſcous Fluid* is that whoſe parts cohere with a greater endeavour than in other Fluids, and ſo of the reſt.

5. This being ſuppoſed, we ſee that the properties which the Mathematicians have aſcribed to *Fluids*, are not ſuch as are peculiar to Water, or to Oil, but ſuch as are common to all. Now the Maſters of *Hydroſtaticks*, in order to explain the nature of Fluids, have aſſumed, 1. That Fluids conſiſt of ſome very ſmall particles; 2. That theſe particles eaſily *ſlide* one over another, or flow; 3. That they are heavy: and from theſe *three* aſſumptions they have deduced the true nature of a corporeal Maſs conſiſting of an aggregate of ſuch *Moleculæ*. This is *Hydroſtaticks*, a ſcience neceſſary to be known, not only by Natural Philoſophers, but alſo by Phyſicians; becauſe almoſt all phyſical changes happen by the help of Fluids: for thus the nouriſhment and increaſe of Animals, Vegetables, and Minerals is formed by Air, Water, and diſſolved Salts; all which are *fluid*.

This is what I thought neceſſary to be premiſed concerning the *nature of Solids and Fluids in general*; which naturally leads us to conſider the *Human Body*; and from thence we ſhall proceed to the *Powers* which *Medicines* exert upon it.

CHAP. II.

Of the Structure of a Body in Health.

1. OUR Body conſiſts of two parts, *Solids* and *Fluids.*

2. THE Solids contain the Fluids, and are ſo united together, that the connexion of every part with the reſt, either mediately or immediately, may eaſily be ſhewn. A Vein and a Lymphatick cohere to an Artery by means of a Gland, which ariſes from the Artery; all the Arteries grow to the *Aorta*, which is inſerted into the Heart; the Heart is united to the Brain by means of the Nerves and aſcending Arteries: the Brain adheres to the *Cerebellum*, and that to the ſpinal Marrow, *&c.*

3. ALL the Canals of the Body ſome way or other communicate with each Ventricle of the Heart.

4. THE left Ventricle of the Heart communicates with the great Artery, which is ſo divided and ſpread, that ſome portion of it reaches to every point of the Body: by which means there is a Cavity continued to every point of the Body from the Heart.

5. EVERY *hollow* point of the Body can tranſmit the liquor contained in it towards the right Ventricle of the Heart, except the *Veſſels* which are called *Secretory* or rather Excretory; ſuch are, (α) the *Sudorifick* Veſſels, (β) the Veſſels for the *Sanctorian Perſpiration*, (γ) the Veſſels which continually *moiſten the Eyes*, (δ) the *Mucous* Veſſels, (ε) the *Salival* Veſſels, (ζ) the Veſſels of the *Gullet*, *Stomach*, and *Inteſtines*, (η) the *Urinary* Veſſels, (ϑ) the *Seminal* Veſſels.

6. ALL the Canals and Receptacles of the Body contain ſome certain Liquids, provided the Body

dy be in health: ſeeing therefore the Canals communicate with each other, the Liquids muſt alſo neceſſarily communicate: hence the agitation which is excited is one part of the Liquids, may be communicated to all the reſt.

7. ALL the Liquids of the Body, except ſuch as are excrementitious, return to the Heart.

8. As long as theſe Liquids are regularly moved within their Canals, ſo long the Man is in *health*; when that motion is irregular, or ſtops in any part, the Man is *ſick*; but when this motion entirely ceaſes in every part, *death* enſues.

9. THEREFORE *Health* conſiſts *in an equal motion of the Fluids, and an equal reſiſtence of the Solids in every part.* The Fluids are ſaid to be *equally* moved, when they make no greater *impetus* on one part than on another. The reſiſtence of the Solids is ſaid to be equal, when they preſs the Liquids *equally* on every ſide; ſo as to cauſe no ſenſation of Pain.

CHAP. III.

Of the ſtate of an Injured, or Morbid Body.

1. FROM what has been ſaid it appears that a diſeaſed or *morbid State* is that condition of the Solids and Fluids in which, by any cauſe, this *equal motion* is in any place diſturbed, interrupted, or ſtopt; and that *death* is the entire ceſſation of that *motion* every where.

2. To heal therefore is, to take away a *diſeaſe* from the Body; that is, to remove and expell the cauſes which hinder the *equal motion* or transflux.

3. MEDICINES are thoſe *mechanical* inſtruments, by means of which an Artiſt may remove the cauſes

by which the *balance* is taken away, and reſtore it.

4. A MEDICINE therefore ſuppoſes a *flowing* of the Humours or Liquids, and therefore acts only on a living Body, not on one which is dead, and deprived of this *flowing*.

5. As a Medicine ſuppoſes the Body to be in Life, which depends on a paſſage of the Fluids thro' the Solids, it is manifeſt, that it acts on the Liquids, or on the Solids yet in *motion*.

6. THEREFORE a Medicine does not act on a *Carcaſs*.

7. EVERY Medicine produces it's effects *mechanically*, namely, by the power of its ſolidity, bulk, figure, and motion of it's particles.

8. THE effect of a *Mechanical* Action is the changing of the figure, motion and bulk of a Body.

9. HENCE in the cure of *diſeaſes*, theſe inſtruments, or medicines do not act immediately, but mediately.

10. As the good or bad effect of the action depends altogether on the bulk, motion and figure of the acting particles, the deſtruction of the *balance* juſt now mentioned muſt be deduced from the Solids.

11. THE *equability of flowing* in the Solids may be deſtroyed three ways: (α) by the taking away of the Liquids contained in the Solids; (β) by the *impetus* and too great force of the Liquids upon the ſurface of the Solids internally, from an external cauſe preſſing them, or an internal cauſe obſtructing them; (γ) by too great an increaſe of the contractile force of the Solid.

CHAP. IV.

Of the Solids and Fluids of our Body in general.

1. HIPPOCRATES (*Lib.* vi. *Epidem. Sect.* 8.) acknowledges three different principles conſtituting the whole Human Body: 1. τὰ Ἴσχοντα, that is, the Containing and Compelling; theſe parts are ſometimes called *firm* or *coherent*, and moſt generally *Solids*: 2. τὰ Ἐνισχόμενα, that is, the Contained; and theſe are now called *Fluids* or *Liquids*, and in Latin *Humores* or *Liquores*: 3. τὰ Ἐνορμῶντα, or, as it is in the text, ſimply Ὀρμῶντα, that is, making an *impetus*; by which I believe the Author meant that which is made by the Human Mind, when it deſigns to move any part of the Body, but how this *impetus* is made we do not know: And it does not ſeem probable that HIPPOCRATES meant by this word the *animal Spirits*, as the Scholiaſts interpret him; but that he only intended to ſignify that our Mind does not act on our Solids and Fluids, or Ἴσχοντα, and Ἐνισχόμενα, *mechanically*, but after an unknown manner. Now as thoſe which HIPPOCRATES calls τὰ Ὀρμῶντα do not make much to our purpoſe in this treatiſe, we ſhall therefore only conſider the *nature of the Solids and Fluids of the Human Body in general.*

2. WE have given a ſufficiently clear general idea of the Solid and Fluid parts in the firſt Chapter; but thoſe parts which are called *Solids* with regard to all Bodies, are properly called *firm*, as I ſaid before, with regard to our Body: and it was ob-

ſerved at the beginning, that all Bodies are compoſed of ſome *firm* and *immutable Stamina*, which by their conjunction conſtitute a Body; and theſe we have called *Elements* of *Bodies*. There are therefore ſome *firſt* and *ſmalleſt* particles which conſtitute the *firm* parts of a Human Body: for even the leaſt particle in our Body that we are ſenſible of, is not one part, but an aggregate of ſeveral; we ought therefore to be acquainted with theſe *Moleculæ*, if we would have a juſt knowledge of the nature of our parts.

3. THESE *particles are ſmall corpuſcles, ſufficiently ſimilar, very ſimple, terreſtrial, brought by the fluid humours to every ſecret place, and added to all the firm parts.* Theſe are the true *Elements*, of which the Human Body is compoſed.

I SAY, in the firſt place, that they are *ſmall corpuſcles*, and this appears plainly from *Anatomy*; for every greateſt part in our Body is compoſed of Veſſels, the Veſſels are compoſed of Membranes, which being rolled up conſtitute a *cavity*; theſe Membranes again conſiſt of Veſſels, which forming the Membranes are again compoſed of Membranes, and thoſe of Veſſels till we come to the *laſt* Veſſel, which has a Membrane compoſed of the *moſt ſimple* Fibres, but no longer *hollow* or *vaſcular*; for otherwiſe it would not be a *laſt* Veſſel, but thoſe Fibres are mere *ſolid* filaments, which conſiſt only of mere *ſolid* and *leaſt* parts, and ſo united and cohering, as to make a *ſimple* Membrane: of which ſee more in the following Chapter. The *Elements* therefore of our Solids are *very ſmall*; but I ſay moreover that,

2*dly*, They are *ſufficiently ſimilar*, or like. For the Solids of many Animals have been examined by Chemiſtry, and from thoſe experiments I have plainly diſcovered, that if a *Bone*, for inſtance, was deprived of all it's Membranes and all it's Liquids,

quids, and was boiled in Water, till the laſt that was poured from it, was full as clear and inſipid, as when it was poured on, that then the *ſolid* Fibres of this *Bone* always remained ſimilar or like to each other: the ſame was verified by experiments on the other parts, as Muſcles, *&c.* And thus alſo it will always happen, even by the greateſt change that can be made in Nature; for if a Bone or Muſcle be burnt, theſe Fibres will not therefore be deſtroyed but will remain ſtrait and extended, as if they were entire, and will be every where in one and all parts the ſame; for they are the ſame, and ſhew the ſame appearance of Matter from a Bone, and from an Artery, a Vein, a Muſcle, a Hair of the Head, *&c.* ſo that what conſtitutes the *firmneſs* of our Body is the ſame every where; which will ſeem ſtrange to thoſe who have imagined, that each part has it's peculiar firmneſs, or peculiar matter, according to it's peculiar firmneſs: for if we conſider an Embryo, is not it's Artery in this ſenſe the ſame as in ourſelves? yes ſurely; for if it is burnt, it will exhibit like Fibres; and a Membrane of an Embryo will yield the ſame after boiling or burning as a Membrane of an Adult; and from every different part there will always be obtained the ſame Matter in both ſubjects. COROLL. I. Therefore that which is *greateſt* or *firmeſt* in the Body is conſtituted of the very ſame matter with that which is *ſmalleſt* or *leaſt firm.* For a Membrane compoſed of Lymphatic Veſſels, which are the ſmalleſt, conſiſts of the ſame Matter with the greateſt and hardeſt Bone. COROLL. II. Therefore the *Firm* parts of our Body differ only in the greater or leſs aggeſtion and compoſition of the *ſmalleſt* corpuſcles of which they conſiſt.

HENCE we may now conclude, that the *laſt Stamina*, of which all our parts, whether greater or leſs, are compoſed, are not only *very ſmall*, but alſo *ſufficiently ſimilar amongſt themſelves.*

But I ſay, 3*dly*, They are *very ſimple* ; for that which in every point of it's Bulk affords the ſame Matter is ſaid to be the *moſt ſimple*, or that is ſo, of which one part is the ſame with all the reſt of the maſs : Now of this kind are all the parts that conſtitute the Human Body, as we have ſeen already.

Then I ſay, in the fourth place, they are *Terreſtrial*, for I do not know any fitter word to expreſs the nature of this *Matter.* For the Chemiſts have given the name of *Terreſtrial* Bodies or *Earths* to thoſe parts which cannot be diſſolved either by Fire or Water, but remain unchangeable in them : and they call thoſe Bodies *Saline* or *Salts*, which diſſolve both by Fire and Water, and unite again into a ſort of ſtony ſubſtance : they give the name of *Oils* or *Sulphurs* to thoſe which are diſſolved by the Fire and burnt, but are not voluntarily mingled with Water : they call ſuch *Spirits*, as are capable of being mixed with Water, and burn with Fire : they mean by *Water* a Body, which, if it is concreted, melts with the leaſt Fire, and is cauſed by it to fly away without ſmell and taſte, *&c.* But none of theſe Characters, except that of *Terreſtrial* parts, agrees with any of the parts of our Body ; for they cannot be diſſolved either by Fire or Water : and ſuch are the *laſt Stamina* of our Fibres ; therefore we muſt neceſſarily call them *Terreſtrial*, becauſe they are moſt ſimple, and we find them always the ſame, alike, and immutable in every part. But the modern Anatomiſts have ſaid that *the moſt ſimple part of the human Body is a Bone :* now in a *Bone* there are Membranes, Marrow, Blood, Lymph, *&c.* and if it is deprived of all theſe, there will remain only, for the *laſt Stamina*, the *Fibrous* and *Terreſtrial* part. Now if any one ſhould ſay, that if a Bone be examined by Chemiſtry, it yields Water, Salt, Oil, and Earth, and therefore that this is the ſubſtance of a *Bone*, he would be greatly miſtaken: for we ſee in burying places, that Bones being firſt dried by the Sun, then moiſtned with Dew and Rain, and then dried again by the Wind and Sun, ſtill are Bones; but ſhould a Chemiſt then exert his whole art, he would not be able to extract any Salt or Oil from them; but the ſubſtance would remain fix'd, without any Salt and Oil; and yet they were perfect Bones before this Chemical Operation. Hence appears what is the ſubſtance or matter of a *Bone*, namely Earth alone, and ſo of the other parts of the Body. Now if we aſk the Anatomiſts what is a *Veſſel?* they will anſwer, a *Veſſel* is a Membrane rolled up in ſuch a manner as to form a conic Canal, and thus is made an arterial Veſſel, *&c.* If we aſk them what is a *Membrane?* they muſt anſwer from their own *Principles*, it is a Texture of many Veſſels, arterial, venal, *&c.* thro' which Liquids are carried and tranſude: but to form a juſt notion of a *Membrane*, we muſt take away all Fluids from the Definition, and thence it appears that the Matter of a *Membrane*, as well as of a *Bone*, is *Earth* alſo. But if we burn a *Hair* with the flame of Alchohol of Wine, to avoid any impurity, it's moſt liquid parts will then be diſſipated; and if we afterwards carefully conſider it, we ſhall ſee that it ſtill coheres outwardly, and ſtiffly retains it's former figure. Hence it appears that the *laſt Stamina* of our Body are compoſed of parts, not diſſolvable either by Fire or Water, and therefore merely conſiſting of *Earth*, joined by an *oily cement*; which alone is deſtroyed by the Fire, the *ſolid* parts remaining exactly the ſame and untouched.

I SAY, in the fifth and laſt place, that *Thoſe moſt ſimple and terreſtrial corpuſcles are brought and added to the firm parts.* For we know that, how large ſoever the bulk of our Body may now be, it was exceeding ſmall at it's firſt formation, and above a thouſand times leſs than a grain of Sand, and has grown to it's preſent ſize from ſo minute an origin; and that all this was brought about by the appoſition of the ſmalleſt *moleculæ* to thoſe which were already compacted together: for if any Fibre was not to have other parts added to it, it could not become longer, and at the ſame time have a coherence in it's parts. By ſuch an appoſition of particles therefore has our Machine encreaſed; and thus have all thoſe Veſſels been prolonged, increaſed, and enlarged; and therefore all the other parts alſo. Seeing therefore all the Veſſels muſt have thus *equally* increaſed, it follows that the *different* particles muſt have been applied to each Veſſel; which could not otherwiſe be done, than by bringing thoſe parts along with the Fluid which is carried through the Veſſels.

4. Having now conſidered the *general nature* of the *firm* or *ſolid* parts of the Human Body, we ſhould now ſay ſomething concerning the *Fluids*; but becauſe the general *properties* of Liquids have been already explained in the firſt Chapter, what may be ſaid of our Fluids in this ſenſe may be taken from that place: for in the definition of them we have there ſaid that *Fluids conſiſt of the moſt minute* moleculæ, *heaped together, and contiguous without coheſion, which yield to the lighteſt touch, and ruſh againſt each other.* Now theſe *generals* perfectly agree with all the humours of our Body, as being *common* to all Liquids.

5. BUT now as no *extravaſed* Liquor is naturally found in our Machine, it is neceſſary, that every change of the Fluids muſt happen in the Veſſels or

hollow Solids, and that after three manners; 1. By an inteſtine motion of the Liquids; 2. By a motion from without, or communicated by the ſides of the Veſſels; 3. By a new mixture of the Liquid.

CHAP. V.

Of the nature of the Veſſels of a Human Body.

1. THE *Solids* are of two kinds, either *hollow* or *without any cavity*; the hollow Solids are called *Veſſels*. But *a Veſſel in general is ſuch a Body as forms a cavity, in which another Body may be contained, and in which for the moſt part a Fluid is contained.*

2. We have ſeen in what went before, that the *laſt* ſtable and *firm* Matter, on which the duration of the Solids depends, is merely *Terreſtrial*, and alſo that this Matter being connected and applied conſtitutes Fibres: for we have ſeen that a *firm* part, on being burnt, at laſt yields *ſolid Fibres*, which are reſolved into ſuch *Terreſtrial* parts as were juſt now deſcribed: whence it plainly appears, that the Fibres are compoſed of thoſe parts.

3. We have ſeen alſo, that theſe Fibres are not *hollow*, but ſolid and oblong filaments, which being applied to each other are joined and *interwoven* with the other Fibres, and after this manner conſtitute a Membrane; and then this Membrane being rolled up makes a Hollow, and thus we now have a *ſmalleſt* Veſſel: in order therefore to gain a juſt knowledge of our Solids, we muſt firſt be acquainted with the Matter of which they conſiſt, and then we muſt know what theſe Fibres are of which the

Veſſels are compoſed, as appears from the burning of Solids. But I have given already a ſufficiently clear idea of theſe Fibres, and have ſaid in general that the Fibres united after a certain manner conſtitute a *ſimple* Membrane: now this is done in the ſame manner as we ſee the filaments of *Flax* being *interwoven* to make linnen cloth; which muſt therefore now be particularly examined.

4. FIBRES and Membranes which conſiſt of Fibres rolled up, or the *leaſt* of all the ſmall tubes, and alſo the *greater* Veſſels compoſed of them, which again conſtitute other Membranes, are faſtned together after *three different manners*, and are in a direction either (1) *parallel*, (2) *interwoven*, or (3) *ſpiral*.

SINCE the *laſt Terreſtrial* Matter, as we have ſeen, firſt conſtitutes Fibres, and theſe are applied to each other, and compoſe a *ſimple* Membrane, and of this *ſimple* Membrane rolled up is formed a *Veſſel*, which is the *firſt* and *ſmalleſt*; if we now take more Veſſels of this kind, theſe being interwoven will conſtitute a Membrane, not now conſiſting of Fibres only, but of Veſſels; this Membrane being rolled up will make another Veſſel; and if we take and *interweave* ſeveral Veſſels of this kind compoſed of Membranes, not *fibrous* ſimply, but *vaſcular*, we ſhall form other Membranes, and of theſe Veſſels again, and ſo on. Theſe Veſſels I ſay, are *interwoven* like linnen or wollen cloth, after *three manners*; (α) for ſome Veſſels are *parallel*, and ſo adhere to each other; (β) others again run in an *oppoſite direction* between theſe *parallel* ones, and cut them at various angles; (γ) there are others which are *ſpirally* interwoven and ſo run among the others. By ſuch an *interwoven* courſe of the Veſſels are formed the *greater* Membranes, and of them the *greater* Veſſels are made, of which the *Viſcera*, and other parts of the Body are compoſed.

5. But now if the Fibres are applied to each other only by *paralleliſm*, then the Membrane is moſt *ſimple*, both with regard to the *Fibres* and their *connexion*; but if the Fibres are faſtned together by the *interwoven* method, then the Membrane is not ſo *ſimple* with regard to it's *connexion* as in the former caſe; but if the Fibres involve each other *ſpirally*, then the Membrane is *moſt compound* in every ſenſe. We have ſeen alſo what was the *moſt ſimple* Veſſel, namely that which is compoſed of the *ſmalleſt* and *moſt ſimple* Membrane, and ſo rolled up as to form a Hollow; the ſubſtance therefore of this Veſſel is the *moſt ſimple* Fibres, which are no longer *hollow*. Now this is the end of the Veſſels; for they do not proceed to infinity, becauſe then there would be no bound to our Body, and conſequently no figure.

6. Having explained the nature of a *ſimple* Membrane, let us now conſider what the other Membranes are: I ſay then that they are not compoſed of *ſimple* Fibres; ſuppoſe for inſtance the *laſt* Membrane *but one*, then it will be compoſed of Veſſels, the Membranes of which are moſt ſimple, that is, conſiſting of Fibres; this *laſt but one* therefore will be called the *ſmalleſt vaſcular Membrane*: and the Veſſels of it will be united according to *paralleliſm*, *croſswiſe*, and by *twiſting*.

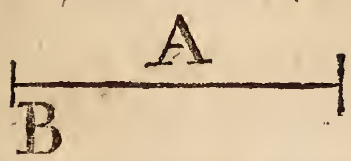
7. But that which follows, the *laſt* Membrane *but two* will conſiſt of Veſſels whoſe Membranes are not compoſed of Fibres, but of the *ſmalleſt* Veſſels: The Veſſels which compoſe this Membrane I take the liberty to call *vaſcular* Veſſels, that is, Veſſels whoſe Membranes are compoſed of other Veſſels; and theſe two are *interwoven* after the threefold manner already mentioned. And thus we proceed to the *thickeſt* Membranes, which conſiſt of much *larger* Veſſels, and by their *interwoven* courſe compoſe

poſe ſtill *larger* Veſſels, and Bowels alſo, and other parts of the Body.

8. This is the moſt accurate idea that can be formed of the nature of the *firm* parts of our Body. And from what has been now ſaid we eaſily conclude that the Anatomiſts can never demonſtrate to us the *ſmalleſt* Veſſels, and *ſmalleſt* Membranes, much leſs the *ſmalleſt* Fibres, but only ſuch parts as are compoſed of them.

9. From what has hitherto been ſaid is alſo evidently deduced the cauſe of *ſtrength* and *weakneſs* in Men. For *ſtrength* ariſes therein from the compreſſion and near union of the *ſmalleſt concrete* Veſſels expelling their Fluid, and ſo making up a ſtronger *Fibre*; ſo that many *fibrillæ* or little Fibres, having thus united all the *fibrillæ* of their Canals, coaleſce into one *Fibre*; which therefore will be ſtronger in proportion to the number of Canals, and conſequently of *fibrillæ* which are *concreted*; and thus it happens in our Body: but if this *coalition* is made in the *ſmalleſt* Veſſels, then the *ſtrength* of the *Fibres* only will be increaſed; but if it happens in the Veſſels which are a little larger, then *Callus's* will be formed. Now the cauſe of *weakneſs* is quite contrary to them as is at firſt ſight manifeſt.

10. But now becauſe the *ſmalleſt* Veſſels of the Body are incapable of being made viſible, not only by the naked Eye, but even by the aſſiſtance of the beſt Microſcopes, we can therefore explain them only by an exact reaſoning drawn from what we know of the greater Veſſels: and this I ſhall endeavour to do after the following manner.



Let A be a *geometrical Inch*; it may be divided into 100 *geometrical* parts ſtill conſpicuous; then let us take the $\frac{1}{100}$ part of it, and call it B; this being done, let us take a cubic corpuſcle, whoſe length is only $\frac{1}{100}$ part of an *inch*; then, as has been done by ſome natural Philoſophers, let us obſerve ſuch a cube with a Microſcope, and keep in our minds the magnitude of it being ſo obſerved: if now we would know how many veſſels may be contained in this *little Space*, let us put the *red* globules of Blood alſo under the Microſcope; by this means, if we compare the magnitude of one globule of *Blood* with the ſize of that *cube*, we ſhall find, as all who have tried this experiment have found, that the diameter of one *red* globule viſible in the Blood is $\frac{1}{100}$ times leſs than the diameter of ſuch a ſmall *cube*; which being ſuppoſed to be no more than $\frac{1}{100}$ part of an inch in diameter, therefore the diameter of one *red* globule is no more than $\frac{1}{100}$ part of $\frac{1}{100}$ part of an inch; that is, if 10,000 *ſuch* globules were placed cloſe to each other, they would equal one geometrical inch. Moreover it has been demonſtrated by EUCLID, that the *ſquares of ſurfaces are as the ſquares of their diameters*; therefore in the ſpace of a *ſquare inch* may be contained *a thouſand times a hundred thouſand* of theſe globules; for to make it more plain by example, according to the *hypotheſis* the diameter of one *red* globule is $\frac{1}{100}$ part of $\frac{1}{100}$ part of an inch; but 10,000 globules are contained in the ſpace of an inch; therefore *it is evident* that 100,000,000 may be contained in the ſpace of a *ſquare geometrical inch*, ſuch as the figure C.

HENCE therefore any one may eaſily obtain the number of Veſſels which may be contained in ſuch a *ſpace*, of which Veſſels the diameter is capable of receiving juſt one *red* globule.

11. Now theſe are what the Eye aſſiſted by the beſt Microſcope is able to ſee in *one ſquare inch*; and it ſees them only becauſe they are opake. But the Eye is able to ſee *a thouſand times a hundred thouſand* Veſſels in this *ſpace*, yet any one would not barely miſtake, but be guilty of the groſſeſt error, who ſhould imagine that ſuch Veſſels are the *ſmalleſt* and *laſt* of all. For theſe ſmall Canals which carry the *red* globules of Blood, if they are *arterial*, give other Veſſels much *ſmaller* than themſelves, namely, the Lymphatics, which grow narrower from their beginning, and are therefore *arterial*; for ſeeing the Anatomiſts have diſcovered and can demonſtrate the Lymphatic Veins, it is certain that they muſt have their little Arteries alſo, to furniſh them with their Lymph, nay and they muſt neceſſarily receive it thence, as will be by and by demonſtrated; but LEWENHOECK has ſhewn that the diameter of one globule of *pellucid* Serum or Lymph of the firſt kind is *ſix times* leſs than the diameter of a *red* globule of Blood; ſeeing this globule, according to the ſame Author's experiment, may be eaſily reſolved into *ſix* other *ſmaller* ones, no longer *red*, but *pellucid*.

COROLL. Therefore the Serous Veſſels or Lymphatics *of the firſt kind* are ſo much *leſs* than the laſt Blood-veſſels.

BUT the Sanctorian Perſpirable matter is ſtill much ſmaller, ſo that, according to the ſame Author *in his 43d Phyſiological Epiſtle to the Royal Society*, under the *ſpace* of one *grain of Sand* may be contained at leaſt, according to his calculation, 125,000 orifices of Veſſels continually and every where exhaling this perſpirable matter in a healthy Man, and therefore an incredible number of them would be contained in the ſpace where *a thouſand times a hundred thouſand* blood Veſſels, as has been ſhewn, may be contained. But what ſhall we ſay of the ſmallneſs of the *filaments* of the Brain which exceeds all belief; for which again conſult LEWENHOECK, *in his firſt Volume of Epiſtles to the Royal Society.*

12. BUT now if any one ſhould aſk whether theſe Veſſels are the leaſt of all? we muſt confeſs that they are far, very far from it. For let us ſuppoſe, what is very probable, that one of the *Animalcules* diſcovered *in Semine maſculino* is the rudiment and *baſis* of a future Man, of the immenſe ſmallneſs of which *Animalcules* the ſame Author may be again conſulted; if now we conſider that in this *Animalcule* perhaps there are Eyes, Noſe, Ears, and all the other parts which afterwards diſcover themſelves in the Man, when he is fully formed; or if any one will not allow this, and will ſay that theſe parts are not yet there, as MALPIGHIUS imagined, but that they grow afterwards, I will not contend with him; but all will at leaſt allow, that in this *Animalcule* the part which becomes an Eye is different from that which becomes a Finger, and ſo on: hence it will evidently follow, that all the *differences* of parts in this *Animalcule*, which become ſenſible only by time, conſiſt of different and diſtinct Veſſels, which in proceſs of time are always extended, that they may increaſe and grow. Let us think therefore, how very ſmall theſe Veſſels muſt be, and what an infinite number of them may be contained in one *ſquare inch.*

COROLL. HENCE it appears, that *anatomical injections*, how ſubtile ſoever, can never bring the *ſmalleſt* Veſſels to our view; for tho' of late SWAMMERDAM, and after him RUYSCH and others, have begun to *inject* Liquids into the *greater* Veſſels of the Body, with ſo much force as to diſtend them beyond their natural dimenſion, yet thoſe Gentlemen, with all their art and induſtry, have never been able to go any farther than to ſhew theſe Veſſels and ſome branches of them in a better manner; and it is manifeſt that thoſe Veſſels cannot be very ſmall, ſince they may be filled with ſo groſs a ſubſtance as wax or any other opake Liquid uſed in *anatomical injections*: for the *wax* which is generally uſed for this purpoſe can ſeldom reach even to the *ſmalleſt blood Veſſels*; for an *injection* made into the *Arteries*, ſcarce comes *once* in a *thouſand times* into the Veins, how then ſhould it reach the very *ſmalleſt* Veſſels of all? Nor would it ſucceed much better, if we were to uſe *Quickſilver* or any thing elſe.

13. We properly give the name of Veſſels of our Body to thoſe Canals, (1) which bring the humours received from the Heart to any inward or outward point of the Body, and theſe are called *Arteries*; (2) which bring the Liquors back again from theſe points towards the Heart, and theſe are named Veins; (3) which contain the humours ſtagnating in them for ſome time, after they are brought thither and ſecreted, as *Sinus*'s, *Veſiculæ*, *Folliculi*, *Glands*, *Cryptæ*, or by what other name ſoever like theſe they are called. Therefore under the name of Veſſels we may properly comprehend every *kind*, both of Arteries and Veins, and alſo of Veſicles, Follicles, Sinus's, *&c.*

14. But the Canals of our Body which bring down the Lymph are of various *kinds*, and of different *decreaſing ſeries*, and juſt ſo many as there are *decreaſing ſeries* of globules which conſtitute our humours. Four kinds of Veſſels therefore may be properly thus diſtinguiſhed; namely, (1.) *Blood Veſſels*, (2) *Serous Veſſels*, or *Lymphatics of the firſt kind*; (3) *Lymphatics of the ſecond kind*, which contain under them many unknown and even *decreaſing ſeries*, till at laſt (4) they come to the

Veſſels carrying the *Nervous Liquid*; which are to be conſidered as the *laſt* Veſſels of our Body.

But here perhaps it may not be amiſs to ſtay a little to *examine* the Lymphatic Veſſels, as I have ſomething to offer on this Subject, which has been not at all, or but ſlightly handled by other Authors.

15. I say therefore in the firſt place, that all the Lymphatic Veſſels, which have hitherto been deſcribed and demonſtrated by Anatomiſts are only mere Veins, which I ſhall prove in the following manner. (α) Every Canal in the Body, which grows broader from a narrow beginning is a Vein: but ſuch are all the Lymphatic Veſſels hitherto deſcribed; for they carry their Liquids from ſmaller branches into greater ones. Beſides (β) a Vein is a Canal into which other ſmaller Canals empty themſelves; but if we ſurvey the Lymphatics, we ſhall ſee that all of them ariſe from inviſible roots, that they are very ſlender, and that they gradually grow larger and larger, by the acceſſion of *lateral* Canals; but that nothing at all can be derived from their greater trunk into the *lateral* Veſſels. (γ) All ſuch Lymphatic Canals have Valves, which is peculiar to Veins, as is well known to all Anatomiſts; for the Valves diſcovered at the beginning of the Aorta and Pulmonary Artery do not properly belong to theſe Arteries, but to the ſubſtance of the Heart. (δ) A Vein is a Veſſel which returns the Liquid towards the Heart, but an Artery is the contrary; now if we conſider all the Lymphatics which have been diſcovered by Lower, Vieussens and Ridley in the Head, we ſhall find that they bring their Lymph into the Jugular Veins: the Lymphatics alſo of the *Thorax* empty themſelves both into the *Ductus Pecquetianus*, and into

the greater Veins of the *Thorax*: if alſo we conſult HEMSTERHUYS, GLISSON, LOWER, MALPIGHIUS, and NUCK concerning the Lymphatics of the *Abdomen*, and *lower parts*, we ſhall ſee that all theſe Authors, and HEISTER alſo, and other later Anatomiſts, teach us, that theſe Veſſels empty themſelves into ſeveral of the greater Veins, eſpecially into the *Vena cava*, *Vena Portæ*, &c. or into the *Ciſterna Lumbaris*, and from thence into the Chyliferous Duct. Thus therefore it will manifeſtly appear, that the Lymphatics which have hitherto been deſcribed by Anatomiſts return their fluid to the Heart by means of the *greater* Veſſels; hence alſo we may conclude that thoſe Veſſels are only mere Veins.

16. BUT every Vein in our Body muſt have it's own Artery, that is, there is no Veſſel that carries it's own humour towards the Heart, without having firſt received it from another Veſſel, except the *Venulæ abſorbentes*, of which I ſhall ſpeak hereafter; whence it manifeſtly follows, that as we have diſcovered Lymphatic Veins in the Body, ſo there muſt be Arteries alſo of the ſame kind. The Veins which carry to the Heart the Lymph that they have received, draw it from the Lymphaticks juſt now deſcribed, as has been already obſerved; but it has been proved that theſe Veſſels are mere Veins, therefore they muſt draw the Lymph from ſome Arteries that are of the ſame kind, that is, from Lymphatic Arteries; becauſe theſe channels cannot be Sanguiferous Arteries: for where the Eye has diſcovered the beginning of one Lymphatic Veſſel we muſt not immediately imagine that to be the origin of it; for Microſcopes diſcover that there are others infinitely leſs, and the proportion may eaſily be ſettled between the laſt Lymphatic Vein viſible to the naked Eye, and the *laſt* that is to be

ſeen only by the aſſiſtance of a Microſcope. But yet even this is not the very *laſt*; therefore the Lymphatic Vein muſt ariſe from an inviſible Veſſel: but that it does not ariſe from the trunk of a Sanguiferous Artery, is proved from hence, that if it did, the Blood globules, which are ſhewn by the Microſcope to be always red, muſt be carried into this Vein; but as no ſuch thing happens, it hence appears as clear as the light at noon-day, that the Veſſel from which the Lymphatic Vein firſt ariſes, muſt neceſſarily be much leſs than a Sanguiferous Artery, ſeeing it receives from ſuch an Artery a Liquor much finer than the *red* Blood; and therefore that it is a Lymphatic Artery of the *firſt kind:* but now as that firſt is not *conſpicuous* where it ends, much leſs can the latter offer itſelf to our *ſight*; nay it cannot be diſcovered even by the aſſiſtance of the very beſt Microſcope, as being *tranſparent*, juſt as in a *Louſe*, the veſſels of which are *tranſparent*, tho' we certainly know, *à poſteriori*, that it has innumerable Veſſels, yet their being tranſparent, hinders us from diſcovering them by the Microſcope.

17. This therefore is our opinion a little more clearly explained. At every place where the *red* Blood is tranſmitted from the Artery to the Vein, there ariſe innumerable little Canals and at leaſt *ſix times* leſs than the diameter of the ſmall Sanguiferous Arteries from which they proceed: and that it is thus we learn from the globules of Liquids viewed by Microſcopes; for the *red* globules which do not enter into thoſe *lateral* Veſſels, if compared with *Lymphatic* globules, will appear *ſix times* larger, as was obſerved before. And thus, whilſt the Blood brought through the ſmall Sanguiferous Artery, is applied to theſe *lateral* Canals, then the *cleareſt* part of the Blood is preſſed thitherward, of *which* (as it is at the ſame time pro-

pelled and cauſed to enter into *theſe lateral* Veſſels) the *red* globules being deprived paſs directly into the Sanguiferous Vein, which is joined to this Artery. Moreover theſe little *lateral* Canals, into which only the cleareſt part of the Blood paſſes, we call *Serous Arteries*, or *Lymphatics of the firſt kind*; becauſe they carry the *Serum* or *Lymph of the firſt kind* after the manner of Arteries, that is from a broader beginning growing more and more narrow. But afterwards the little Arteries being prolonged and gradually diminiſhed, end each of them in a Vein *of it's own kind*; which at firſt indeed cannot be *conſpicuous*, on account of it's exceeding ſmallneſs, but when ſeveral of them are aggregated, and by their concurrence and joining have formed a much larger trunk, then at laſt *that Veſſel*, which we have ſhewn to be a *Lymphatic Vein*, comes into ſight.

18. BESIDES it is to be imagined, that the Lymphatic Arteries, where they paſs into Veins *of their own kind*, form alſo *lateral* Canals, which are ſo much *leſs* than theſe Lymphatic Arteries, as they themſelves are *leſs* than the *laſt* Sanguiferous Arteries from which they aroſe, as was ſaid before; and theſe Veſſels we call *Lymphatics of the ſecond kind*, and ſo on: we do not know however how many *decreaſing Series* there are of theſe little Canals but we may certainly think they reach ſo far, that the Veſſels which *carry the Nervous Fluid*, are the leaſt of all. Now as the *red* Blood returns from the Sanguiferous Arteries into the Sanguiferous Veins, ſo the Lymph of the firſt kind returns into a Lymphatic Vein of the firſt kind, and the Lymph of the ſecond kind into a Lymphatic Vein of the ſecond kind, and ſo on. By this means therefore, according to that Law all the humours are derived

from the Heart thro' the Arteries into the Veins, and from thence return to the Heart.

19. THAT it ſhould be thus in our Body, and that ſuch *ſmalleſt* Veſſels ſhould be in a very great number, ſeems altogether neceſſary, if we conſider the Skin, Tendons, Membranes, Bones, *&c.* for we find but very little and ſcarce any *red* Blood in theſe parts, and yet they are nouriſhed and grow as well as the reſt, where the *red* Blood abounds; now it could not be ſo in thoſe parts, unleſs their Lymphatic Veſſels were filled, and unleſs ſo much as has been waſted, was applied and added from the *Lymphatic* Liquor to proper places; to perform which this Liquid muſt be applied to all the points of the Body. Beſides, at the beginning of the formation of an *Embryo* there is not found any *red* Blood, and yet the human Body never increaſes ſo quick and ſo much at any other time. Nay indeed if we examine carefully with Microſcopes, we ſhall find that the greateſt part of an *adult* human Body is void of *red* Blood, and is therefore compoſed of Lymphatic and Nervous Veſſels. Laſtly, It is to be obſerved, that the Body could neither *bend* itſelf, nor remain *flexible*, if it did not conſiſt of infinitely ſmall parts; now the Blood Veſſels are not of this ſort, but thoſe rather which carry a much finer Liquid than the Blood: and this indeed evidently appears in the Skin, which is the moſt *flexible* of all the parts of our Body; for in it, as has been ſaid, there are hardly found any Blood Veſſels, but only *ſmaller* ones, namely Lymphatics: for, as is ſelf-evident, the ſmaller the Veſſels are, the more eaſily can we bend any part compoſed of ſuch Veſſels; now the whole human Body almoſt entirely conſiſts of ſuch; for the *greater* Membranes are *flexible* only becauſe they are compoſed of the *ſmalleſt* Canals; and ſo of the reſt.

20. But though we do not know, how many kinds of Lymphatic Veſſels there are, yet we believe that the *ſubdiviſion* of them proceeds much farther, nay and farther than is commonly thought, and that the different *ſeries* of them *decreaſe* in the ſame manner, and by the ſame law: and we muſt think, that, as the diameter of a Lymphatic Artery of the *firſt kind* is *ſix times* leſs than the diameter of a *laſt* Sanguiferous Artery, as I obſerved before was proved by Lewenhoeck, ſo the diameter of a Lymphatic of the *ſecond kind* is alſo *ſix times* leſs than the diameter of a Lymphatic of the *firſt kind*, and conſequently *ſix and thirty times* leſs than the diameter of a Sanguiferous one: nay I believe that ſuch a *ſubdiviſion* proceeds, till all the Veſſels are *equally* ſmall, and all the Liquids are alſo *equally* divided, ſo that, as was ſaid before, all of them *end at laſt* in Veſſels as ſmall as the *origines of the Nerves*; but I do not think there are any Liquids in our Body finer than the *nervous Fluid*, or any Veſſels ſmaller than the *Tubes that convey it*.

Coroll. Thus therefore it is manifeſt that there are *Nerves* in this ſenſe every where, which ariſe not only from the Brain and Spinal Marrow, but alſo from the *laſt* Lymphatic Arteries every where.

But when we ſay there are *Nerves* every where, and therefore that the whole human Body conſiſts of them, we ſhould add, whether thoſe little Tubes ſtill continue to carry their Liquor, or whether they are joined together and conſolidated; and that is to be underſtood in this ſenſe, that an *Embryo*, whilſt it begins to be formed in the Womb, is at that time compoſed only of mere *Nerves*, or *ſmalleſt* Veſſels carrying Liquids; but afterwards many of theſe *Tubes* are bound together, united and conſolidated. In proceſs of time, 1. *Membranes* are formed of *Veſſels*, 2. *Cartilages* are made of *Membranes*, and 3. *Bones* are formed of *Cartilages*. But in what manner the *ſmalleſt*, *greater*, and *greateſt* Membranes are compoſed of Veſſels, has been abundantly explained already; for that the very *ſmalleſt* Membrane of all is compoſed of merely *terreſtrial*, ſolid and oblong Fibres, *&c.* has been clearly demonſtrated. Now in this place, I add, that a Fibre is alſo made of a Veſſel, whether that Veſſel conſiſts only of Fibres, or of *vaſcular* Membranes, and that after *three different ways*; 1. If the Liquid, which kept the ſides of the Veſſel aſunder, be ſqueezed out; 2. If the ſides of this Veſſel be preſſed together; 3. If the ſides meet and grow together. Hence therefore, where theſe *three* conditions meet, a Veſſel may become a Fibre, which is ſo much the more *elaſtic*, as it is thicker than the *firſt* Fibre, which compoſed that Veſſel together with the other united Fibres. Thus for example, let us ſuppoſe that the *leaſt* Veſſel in an *Embryo* conſiſts of 1000 *Fibrous* Filaments; if now all the Liquid is ſqueezed out, and the ſides are compreſſed, and being compreſſed coaleſce, then of this Veſſel is made *one* Fibre; therefore of a *thouſand* Fibres only *one* will be compoſed: but the *elaſticity* always remains in *each* of theſe Fibres; *each* of them therefore muſt act by it's own *force*; hence that Fibre will be a *thouſand times* more *elaſtic*, and more tenacious of it's poſition, as being compoſed of 1000 others, and ſo on. Hence therefore we ſee, that if any Membrane conſiſts of a texture of ſuch Veſſels, ſo that very many Veſſels become Fibres, then it will become more ſolid, more hard, more white, more elaſtic, and ſo will be a Cartilage; for a Cartilage is made, when many Veſſels, which by their texture conſtituted a Membrane, no longer remain Veſſels, but grow together and conſolidate: concerning which conſult MALPIGHIUS, who ſhews how the *white*

Star is formed in Bones, whilſt they are yet *membranous.* But in this Cartilage, it is both formed of a Membrane after this manner, and there are alſo ſome *Strata* made of compreſſed Veſſels, and there are alſo other *Strata* of Veſſels not yet compreſſed, and of others which compreſs thoſe already compreſſed; for thro' them Liquids flow exciting a pulſation in theſe Veſſels: thus therefore a Cartilage is formed *lamellatim*, ſo that there are always Veſſels which carry a Liquid between thoſe *lamellæ*. But now if theſe *cartilageneous Strata* are more and more compreſſed together, they become at laſt a very hard, compact, dry body, which is called a *Bone*. We have ſeen therefore that a *Bone* is united and compoſed firſt of many Membranes, which lay in *lamellæ* one over another, and of which ſome were already conſolidated, and after this manner formed hard *lamellæ*, between which however there were ſome *ſpaces*, where ſome Veſſels which convey their own Liquid were ſafely repoſited: ſeeing now that between theſe *lamellæ* there run ſometimes *ſmaller* and ſometimes *larger* Veſſels, therefore they conſolidate ſometimes ſooner and ſometimes later. For in thoſe *ſpaces*, where the *greater Arteries* paſs, there being a more copious and ſwifter paſſage of the Liquid, there ariſes alſo a *greater diſtenſion* of the parts between which they run, than elſewhere; whence it comes to paſs that theſe *Strata*, between which thoſe *greater Arteries* paſs, are farther removed from each other; after this manner therefore ſome *Sinus's* are hollowed, which at firſt were not in the Bone, but are found in it, a long time after the formation of the Bone. Moreover the Bones are more ſolid *in the middle*, than at the *apophyſes*, becauſe they always begin to *harden* firſt *in the middle*; for CLOPTON HAVERS has demonſtrated that in that place the *greateſt Artery* paſſes, whence there is the *greateſt* pulſation there, and the *greateſt* compreſſion alſo of the neighbouring *Strata*: thus therefore in that place firſt of all the Membrane begins to become a Cartilage. But as the *ſame Artery* afterwards continues it's preſſure, the Bones therefore become moſt compact and hard alſo *in the middle*; they are alſo the thinneſt, becauſe they are there immediately conſolidated, and ceaſe to grow in *Infants*, whilſt the other parts of the Bones ſtill continue to be extended. If any one deſires to know more of theſe things, let him conſult KERKRINGIUS in his *Oſteogenia Fœtuum*, and the ſame Author's *Anthropogeniæ Ichnographia*; alſo MALPIGHIUS in his *Poſthumous Works*, and in his *firſt Epiſtle to* SPON, and in his Treatiſe *de Ovo incubato, & de formatione pulli in Ovo*; alſo LE CLERC in his Book intitled *l'Oſtéologie exacte & complete, &c.* where there are ſome excellent obſervations concerning the *formation of the Bones in a Fœtus*, which were taken however from the *Lectures* of that incomparable Pariſian Anatomiſt, and Regius Profeſſor, JOS. DU VERNEY. Let thus much ſuffice to be ſaid on this Subject, and let us now return to the path from which we have digreſſed.

21. IT is to be obſerved in the laſt place, that the *laſt* Lymphatic Arteries end with *open orifices* in two different ſituations in the Body; 1. *partly without the Body*, namely *at the Skin*; 2. *partly in Cavities within the Body*. But this Lymph which is poured into the Cavities of the Body, *partly* alſo exhales thro' the Mouth, Noſe, *&c.* and vaniſhes into Air; *partly* is received by the *Abſorbing Veins*, which the diligent inquirers into the Animal Œconomy, and principally BELLINI and VIEUSSENS have ſhewn by their experiments to ariſe not only at the Skin, but in all the internal Cavities, and returns into the Veins and to the Heart, that it may again perform the offices of Circulation and Secretion:

tion: for as, according to the doctrine of HIPPOCRATES and the experiments of SANCTORIUS, the whole human Body is both *expirable* and *inſpirable*, therefore not only the Skin, but all the Membranes alſo that form Cavities in the Body, every where and at all times, as long as the Man is in health, *both expire and inſpire the fineſt Liquids.*

22. FROM what has been ſaid above it has evidently been ſhewn, that there is no point in the Body, that is not *vaſcular*, as may be proved by experiments. (α) For there is no part of the Body, out of which there does not flow a *Liquor*, upon the ſmalleſt wound made by the point of a needle or the ſting of a fly. (β) It is ſhewn by Microſcopes that thoſe Puſtules full of *Fluid*, which are wont to be raiſed in any part of the Body, by the application of Cantharides, are only a congeries of very many ſmall Veſſels at that time running out together, as is ſufficiently proved alſo by acid and alkaline Salts, and burning with Fire. (γ) It appears alſo from the Sanctorian Perſpiration, which tho' it is ſo ſubtile as to eſcape the ſight of our Eyes armed with Microſcopes, yet may be obſerved by means of a *looking glaſs moiſt* with the perſpirable Humidity.

23. NAY the very Bones conſiſt of a congeries of many Veſſels filled with a *Liquid*, which is conveyed to them from minute Arteries: for if wax is injected into the Subclavian Artery, the Bones of the Arm immediately *redden*; for the wax being injected propels the Blood in a large quantity into the Perioſteum, and thence on the ſurface of the Bones, which, as it ſwells with Blood, muſt neceſſarily *redden*: in like manner it is found that the white of the Eye is *vaſcular* and *ſanguiferous*; the ſame ſtructure alſo is diſcovered by the help of the Microſcope in the ſmalleſt Membranes, and in the roots alſo of Nails and Horns, and in all the mi-

nute parts: but if it is ſo in the ſmalleſt parts, and in thoſe which are moſt remote from the Heart, how much more is the ſame to be expected in thoſe which lie neareſt to it?

24. EVERY Veſſel has a cavity and ſides compoſed of the ſtructure of the *ſmaller* ones cohering with each other, the ſides of which are again compoſed of *ſmaller* ones, and ſo on, as was ſaid before, till they come to the *ſmalleſt* and *laſt* Veſſels; the cavities of which are ſo ſmall, as not to admit the entrance of any, except the very *fineſt*, Liquids, and in truth ſeem to be the next degree to none at all. That the ſides of the *greater* Veſſels are compoſed of *ſmaller* Veſſels is confirmed, 1. By the experiments of RUYSCH, for if *red* wax is injected with great force into an Artery, it's whole ſurface will grow *red*. 2. In Animals that are ſtrangled, the Blood which flows thro' the Carotid Arteries, it's paſſage thro' the Veins being obſtructed, turns back, and ſtagnating in the *ſmalleſt* Veſſels, inflates them and makes them *red*. 3. The ſame will appear in the Artery of a living Animal if it is bound hard.

25. THE *leaſt* Veſſels have a determinate bigneſs, for otherwiſe they might be infinitely divided; and thus they determine all the parts of our Body, and ourſelves alſo, as was obſerved before.

26. THE determination of the Veſſels ariſes from the continual *preſſure* of the Air on our Machine, for if it exceeds the *power* of reſiſtance with which the contained Fluid is endued, the ſides of the Veſſels will immediately collapſe; whence *Solidity* enſues: thus ſome of the larger Veſſels, as thoſe which are called Umbilical, the *Foramen Ovale*, the *Urachus*, *&c.* turn to Ligaments in a few days after the birth; thus the Nails and Horns ariſe from the conſolidated extremities of the ſmall Arteries; a *Callus* alſo owes it's origine to ſeveral Veſſels being compacted; now

if this is done in the *larger* Veſſels, how much more eaſily may it happen in the leaſt?

27. The *laſt* ſides of the Veſſels of all Canals, whether they are Arteries, Veins, Lymphatic Veſſels, or Adipoſe Ducts, or by what other name ſoever they are called, are *nervous*, and like to *Nerves*, and in them the true Nutrition of Solids is made.

28. Hence alſo the *laſt* of all the Solids in our Body are mere nervous *Stamina*, for they are compoſed of *Nerves* compacted and conſolidated by concretion, except thoſe parts which are formed by coagulated Liquids, ſuch as *polypoſe*, *ſtony*, and other concretions: and this may be fully proved. For according to the diſcovery of Malpighius, and afterwards of Lewenhoeck, the firſt *principle* of our Body is only a *Worm*, which at it's firſt being in the *Uterus*, conſtitutes a Spinal Marrow; then are added to it five limpid *Bullæ*, which become the Lobes of the Brain, to which grow the Globes of the Eyes; then from the middle of that *carina*, as Malpighius calls it, ariſes a *crooked tube*, which afterwards acquires four inequalities, and theſe are gradually bent and become the Heart; then the Integuments of the *Thorax* and Bones are formed, and afterwards appear the Liver, Spleen, *&c.* and at laſt ariſe the *mucuous Stamina*, which involve the whole Body. Hence it appears that all theſe *ſolid Stamina* proceed from the Spinal Marrow: nor is it wonderful that ſuch hard Bodies ſhould ariſe from ſo ſoft a *principle* as the Spinal Marrow; for thus the Horns, Nails, *&c.* harden from ſoft Nerves; and if the bulk of the Brain and Spinal Marrow be compared with the bulk of all the other Solids, it will not appear too large to have riſen from the Brain and Spinal Marrow. Now as all the Veſſels, whether they contain any Liquid, or being already united contain none, ariſe from the Tendons of the

Heart, and theſe conſiſt of *nervous* Filaments, and all the Integuments alſo of the Glands and Bowels are compoſed of Integuments of Blood Veſſels; and as the Bones are made of Membranes, gradually hardening into Cartilages, and then into a bony ſubſtance, and a Membrane by a coalition of the *ſmalleſt Veſſels*, which ariſe from *Nerves*, as has already been particularly explained, it is therefore manifeſt, that every part of our Body is *nervous*, whence follow two COROLLARIES.

I. EVERY Body acts on the *ſolid parts* of our Body, and therefore impinges either on the *nervous Tubuli*, or on parts compoſed of *conſolidated Nerves*.

II. EVERY *power* therefore of any Medicine, ſo far as it *acts* on the Solids, *acts* as being applied to *Nerves*, or to parts formed by a coalition of *Nerves*.

Properties of the NERVES.

THEOREMS.

1. IN the *ſmalleſt* Veſſels the proportion of Solid to the Fluid contained in it *increaſes* as the Veſſels become *finer*; hence the exteriour parts are more ſolid, becauſe they conſiſt of more and finer Veſſels.

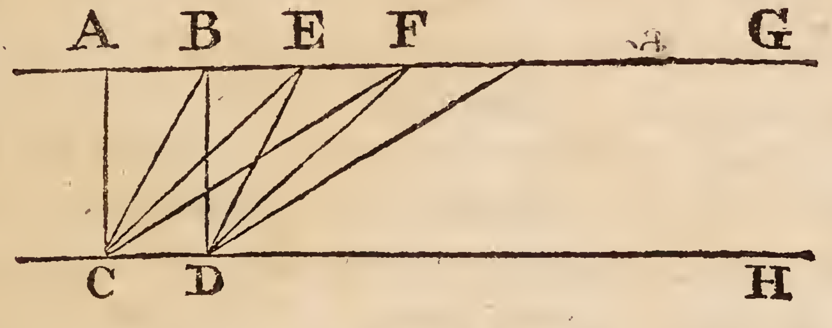
2. THE *ſmaller* the Veſſels in our Body are, the more the points of *contact* between the *ſides* of the Veſſel and the *ſurface* of the Fluids paſſing through them are multiplied; for in the *ſmalleſt* the *ſurface* of almoſt every globule impinges on the *ſides* of the Veſſels.

COROLL. HENCE in the *largeſt* Veſſels their intercourſe is *leſs*, and on the contrary, in the *ſmalleſt* Veſſels it is *greater*.

3. THE *ſmaller* the Veſſels are, the more the *power* of the Solid on the Fluid increaſes, and the

greater they are, the more that *power* is diminiſhed: by *power* I underſtand in this place the faculty of communicating motion. The demonſtration is thus: It appears from *Mechanics* that, the reſt being equal, the *power* or *force* of any ſolid Bulk or Maſs is as Bulk is to Bulk; now as the *force*, ſo is the *reſiſtance* of one Body to another, as Bulk to Bulk, the reſt being equal: ſince therefore, by this *Theorem*, the proportion of a Solid to the contained Fluid *increaſes* as the Veſſels grow *ſmaller*, the truth of this *Theorem* is manifeſt.

4. The *power* of a *laſt* Solid on the contained Fluid is no other than the *endeavour* to *contract it's ſelf*, for by that *endeavour* the motion of the Fluid is promoted; for the more the Veſſels are *prolonged*, the more they exert their *force* on the Fluids; and that, becauſe the more they are *prolonged*, the more is their diameter contracted: which is thus demonſtrated. Let A G and C H be two parallel lines infinitely extended, and let A C, B D be alſo parallel to each other, and likewiſe C E, D F, then from the point C to B draw the line C B, and from the point D to E the line D E; it is manifeſt from Euclid *, that the parallelogram A B C D is equal to the parallelogram CDEF, and that the triangle BCD, is equal to the triangle CDE, notwithſtanding the ſides of the parallelogram A B C D, and the ſides of the triangle B C D are leſs than the ſides of the parallelogram CDEF,



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* Book I. Prop. 35.

and the ſides of the triangle CDE, and ſo on. The ſame is demonſtrated alſo of cylinders and cones, which are generated by turning thoſe planes about their homogeneous ſides: now ſince all the Veſſels of the Body are either *cylindrical* or *conical*, it is manifeſt, that thoſe Veſſels are more *contracted*, the more they are prolonged. All the *force* therefore of the ſmalleſt Solids on their Fluids depends on the *force* which contracts thoſe Veſſels or Solids.

5. THE *force* of all the *greater* Veſſels ariſes from the aggregated *force* of the *ſmalleſt*; for every Artery has it's *force* from it's *ſides*, which are compoſed of the *ſmalleſt* Veſſels.

6. ALL nutrition or reſtitution of what is waſted, all accretion or augmentation of a ſolid Fibre is made only in the *ſmalleſt nervous* Veſſels, and not in the *greater*, as in the Arteries, Veins, Glands, Lymphatic and Adipoſe Veſſels; becauſe the augmentation and accretion of the *greater* intirely depends on the extenſion of the *ſmalleſt lateral* Veſſels, which are *nervous Tubuli*; therefore nutrition which is made by the application of any part to the place of a waſted part, happens in thoſe *ſmalleſt* Canals, of which the *greater* conſiſt. Thence it follows that all Medicines whatſoever, whether *filling*, *evacuating*, or *altering*, act only on thoſe *ſmalleſt* parts.

7. EVERY change of the Fluids is made in the *ſmalleſt* Veſſels, and is owing to the *force* of them; it alſo in ſome meaſure depends on the nature of the Liquids themſelves, which flow through thoſe Veſſels.

8. THERE is a *force* in all the ſides of flexible Canals, by which the parts endeavour to *approach* each other, that they may be ſhorter than the *line of direction* which is appropriated to the Fibre: and that *force* is found in every *point* of the Fibre.

9. THAT *force* by which the parts endeavour to *contract* themſelves, is reſtrained and witheld by the *points* to which the Fibre is applied, namely, by the diſtending Liquid.

10. THIS *force acts* truly and phyſically at that time in which the Fibre ſeems to be at reſt: for example, in *Fig.* 1. let A be ſome *fixed* point, to which

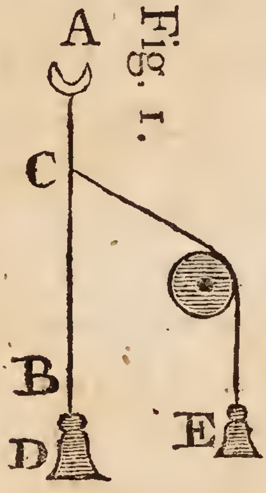
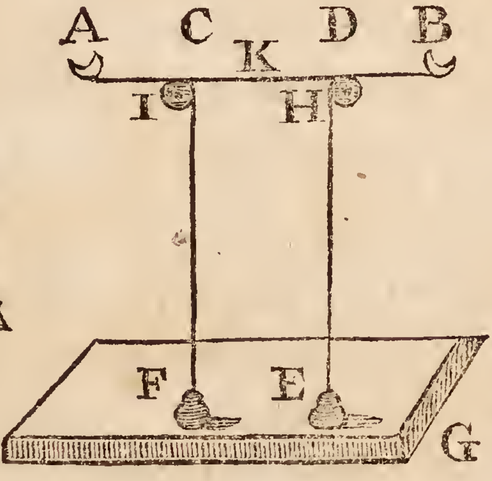


Fig. 1.

Fig. 2.



let the muſic ſtring A B be ſuſpended, and let D be a weight hung to the ſtring, and very much diſtending it; at the point C let there be applied another ſmall weight E, hanging from another *ſtring* fixed to the former at the point C, and paſſing over a pulley faſtened to a fixed point, and ſo ſuſtaining this weight, which is to be hung in ſuch a manner, that the *force* of the former *ſtring* may exceed the *force* of this weight, ſo as to be not at all or but very little bent by it: theſe being ſo placed, let the former *ſtring* be cut between the points B and C, near the point C, with a very ſharp knife, ſo as not to impreſs any motion on the *ſtring*; then the upper part AC will immediately *contract* itſelf and raiſe up the weight E a very little upon the pulley. It is manifeſt therefore that the *ſtring* before the diviſion, exerciſes it's *contractile power*, though it cannot actually contract it's ſelf becauſe of the *weight* hung to it. In *Fig.* 2. let A B be two fixed points, between which let there be a ſtring greatly ſtretched; to this ſtring at the points C D let there be faſtened two threads C F and D E, to the extremities of which let there be annexed the weights F and E, which may be ſuſtained by the table G; and let H I be two pulleys, lightly touched by the ſtring AB: then let the *ſtring* be cut as before, *Fig.* 1. but in the point K, in the *middle* between theſe two ſuſpended threads; then both the parts K A and K B of the divided *ſtring*, *contracting* and drawing themſelves back towards their *fixed* points will raiſe up the weights E and F a little upon the pulleys H and I. There is the ſame power of *contracting* in the Fibres of our Body, as may be ſeen in a Fibre *cut* tranſverſely; for it *contracts* it's ſelf towards it's *fixed* points, and this is it which cauſes wounds made in the Body to *gape.*

11. THAT *force*, by which any part of the Body endeavours to *contract* themſelves, is *balanced* by that *antagoniſtic force*; for all the parts have that contractile power, and when they draw towards the *oppoſite points*, they are antagoniſts to each other.

12. THE *balance* of this *contractile force* in our Body depends upon the *equal influx* of the Liquid, and it's impulſe on all parts, ſo as to diſtend them *equally.*

13. WHATSOEVER therefore any where changes the *momentum* of the *influx* of a Liquid, ſo that it does not *equally* flow into all the Canals; and whatſoever takes away the *balance of the reſiſtance* in the Canals, takes it away in the whole Body: whence there are two cauſes of this *balance*, the *reſiſtance of the Canals*, and the *influx of the Fluid.*

14. AS ſoon as the *balance* in any part of the Body is taken away, the *oſcillatory motions*, or thoſe *motions*

motions which are made whilſt ſome Canals being unuſually extended contract themſelves, undergo a change alſo in that place; and this depends on the *prevalence of the reſiſtance* upon the *force of the influx* of the Liquid; and is deſtroyed whenſoever the *force of the influx* exceeds the *force of the reſiſtance.*

COROLL. THEREFORE the *ſum* of all the *forces* may be derived into *one* part, and thus it is manifeſt that ſome new motion may appear in that part.

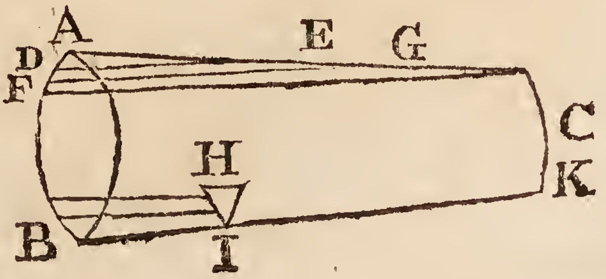
CHAP. VI.

Of ACRIDS.

1. THE *balance of the oſcillatory motion* in the Body is never more taken away, than when ſome *Acrid* inſinuates it's ſelf into the cavity of a *ſmalleſt Veſſel*, and *ſticks* in it's ſides, and remains fixed.

2. IT is ſhewn by Microſcopes that *Acrids* conſiſt of ſeveral ſtyles ending in a *point*, or forming an *edge* like a *knife*, or ſword; whence they are able to gnaw, prick, and cut like ſo many little *wedges* in the ſmall *points of reſiſtance.*

3. IF an *Acrid* is infixed into the *ſide* of any Veſſel, then the whole *force* of the Liquid flowing in, which uſed to act on the various *points* of the ſide, is now determined to that *point*, in which the *Acrid* is fixed: and hence ariſes a *convulſion* of that Canal: which is thus demonſtrated. A B C is a portion of any Veſſel, in which the *lines* deſcribed determine the *flowing* of the Liquid thro' the Canal: the line drawn



drawn from D impinges upon E, and that which is drawn from F impinges upon G, and ſo on, and all theſe *lines* are put here, as Liquids flowing in with *equal force*, and impelling the *points* on which they impinge and diſtending them *equally*; and as the Canal is *contractile*, thoſe *points contract* themſelves *equally*, and reſiſt the impulſe, and ſo the *oſcillatory motion* is preſerved. But if we ſuppoſe any *acrid* Body, as H I, to be *fixed* into the ſide, in the point I, it cannot be moved from this *point* by the Liquid flowing in, becauſe the preſſure from the part H C is equal to that from the part B H: hence all the Fluid that is contained between B H will ruſh on the ſurface H I, which will ſuſtain the whole *force* which ought to be ſuſtained by the whole length from I to K, and all it's points; now all the *force* which is impreſſed on the ſurface H I, is communicated to the point I, which, as the Canal is flexile, muſt give way, as being more preſſed than the other *points* of the ſame ſide; and as the Canal is elaſtic, the more it is preſt, with the greater *force* it reſtores itſelf; whence it comes to paſs that the *balance* of the *oſcillatory motion* is deſtroyed, and the Veſſel driven into *convulſive* motions. Bodies which can produce this effect, are chiefly *volatile and fix'd acrid Salts*, and the *corroſive particles of Metals* which hurt becauſe of their figure being like the wedge H I, and *affect* the Body as being Solids, not as being Fluids.

From this demonſtration the following truths and Corollaries are drawn.

I. The ſtiffer and leſs flexible the *infixed* particle is, and the deeper it is *infixed*, the worſe and more vehement will the effect be: and thence it happens, that the particles of *Metals* reduced to an *acute* figure, as *Corroſive Sublimate*, *Red Precipitate*, &c. have much more vehement effects on our Bodies, than any particles taken from Vegetables or Animals; for they are much more *rigid*, and having more *gravity*, are more deeply infixed into the ſides of the Veſſels.

II. The *heavier* any particle is, the more *vehement* is the effect of it, and the *longer* will it remain, for the reaſon juſt now alledged.

III. The reſt being equal, the *greater* the *force* of the Fluid is in the part B H, the more *vehement* is the effect of the *infixed* particle, and the deeper it is *infixed*; whence it follows, that the *force* of the Heart very much contributes to excite this *Acrid* to a *ſtimulating motion.*

IV. Wheresoever the *influx* of the humours into the Veſſels ceaſes, there alſo is loſt the whole *force*, both of *Medicines* and Poiſons; hence it follows, that a *Cauſtic* being *applied* to ſick Perſons reduced to extremity and almoſt at the point of *death*, in whom the circulation of the humours continues only in the parts near the Heart, can hardly *act* at all; when the very ſame application being made to a *ſound* and vigorous Body, *operates* in a very ſhort time.

V. In a *Carcaſs* therefore, where every thing is *at reſt*, the *infixed* particle has no ſort of effect.

VI. Liquids are carried on in *parallel* lines in *cylindrical* as well as in *conical* Bodies; and therefore the *Acrid* particle *infixed* has the ſame effect in the *cylindrical* as in the *conical*, but milder in the former than in the latter. For the *force* of the Liquid on the particle *infixed* at F, as in *Fig.* 1. if it is a little preſſed towards G, which may eaſily be, becauſe the Liquids do not reſiſt on the other ſide, as in the *conical* Veſſels, will paſs towards B D where it will find a Space equal to the former A C. But it is otherways in the *conical* Veſſels, for in *Fig.* 2. the Fluid which runs from the part A D C on the particle E F *infixed* into the point F, after paſſing between G E, finds a *ſpace* of leſs capacity than that

Fig. 1.

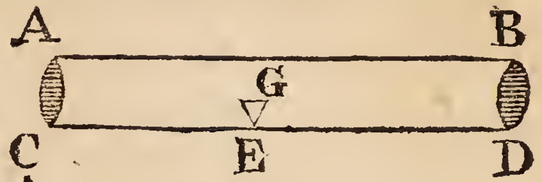


Fig. 2.

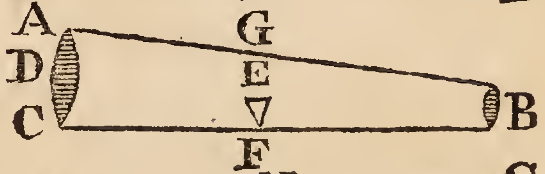
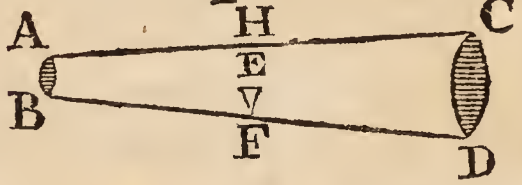
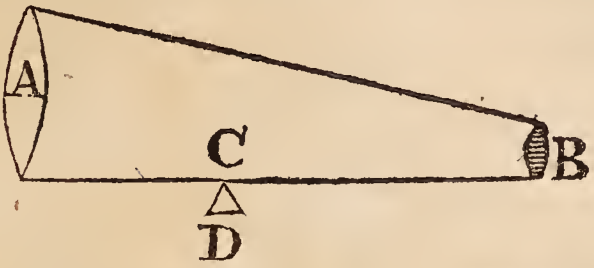


Fig. 3.



from which it flowed; and therefore here is a greater *endeavour* and *preſſure* of the Liquid, in flowing towards B, than was in the *cylinder*. Let us ſuppoſe in *Fig*. 3. that the Liquids flow with a contrary and inverted motion in the *conical* Veſſel A B C D, which ſhall here be conſidered only as a Vein. The Liquor flowing from A B impinges only in a few particles on the particle E F *infixed* into the point F, and will indeed *impel* it a little towards D, the Liquid not reſiſting on that ſide, and will eaſily enough paſs thro' it, becauſe the ſpace H E has as much, nay more capacity than A B. The *force* therefore *impreſſed* on the particle by the Fluid running in, is in this caſe almoſt none: whence *Acrids* never *act* leſs on the Solids, than when they are applied to a *cavity* which grows broader from a narrow beginning; and ſuch are all the Venal Veſſels.

VII. If any *Acrid* ſticks *externally* to the ſide of a Veſſel, the ſame effect will follow, as if it adhered *internally*; for the point C in the following *Fig*. muſt neceſſarily be diſtended by the Liquid flowing in and *equally* preſſing the Canal A B; and therefore it will preſs the adhering *Acrid* particle D, and ſtrive againſt it: and when from the preſſure of the Atmoſphere or any other cauſe it cannot give way, it muſt neceſſarily penetrate the ſide of the Veſſel, and hinder the *equal* motion of the Fluids: of this ſort is the *action* of Plaſters and all ſtimulating Medicines applied *externally*: hence we infer that the *action* of Medicines conſiſts in removing impediments to the *equal motion* of the Fluids.



VIII. By this *poſition* alone of one particle, all the reſt remaining in their natural ſtate, can the Secretions be *altered* or *diſturbed*, the Canals dilated, the concuſſive *force* of the ſides *increaſed*, and the *oſcillatory motion* deſtroyed.

IX. *SECRETION is the derivation and ſeparation of one Liquid from another*; every Liquid conſiſts of minute *ſolid* particles; and the maſs of Liquids is very greatly *mixed* as appears by *Chemiſtry*; for the various ſpecies of Solids, which being *mixed* conſtitute a Liquid, may be confounded, and turned to Solids again. There are three things neceſſary to Secretion; 1. An application of the Liquid to the orifices of the Canals, 2. A determinate magnitude of the ſaid orifices, 3. A ſufficient force to impel the Liquid within the Canals: but now if an *acrid* particle *infixed* ſhould cauſe the Canals, for example, thoſe of the *Kidneys*, to be wider or narrower than uſual, then the particles of Fluids that are *greater* or *leſs* than *uſual*, would paſs thro' them: hence the *variation* of the ſecreted Urine, for ſometimes it appears *limpid*, and ſometimes thick. But if the *acrid* Particle ſhould be ſo far preſſed, as to *perforate* the ſide of the Canal, then a wound would be made in the Canal, equal in bigneſs to the *acrid* Particle; which indeed might be ſo far opened by the *contraction* of the Fibres, as to let out the Fluid contained in the Canal; hence alſo happen *droppings*, *ſalivations*, and many other *unnatural* evacuations in our Body, where the *wound* is made in Veſſels ſufficiently *large*; but if the *perforation* is made in any very *minute* Veſſels, ſuch as ſome are in the Lungs, then there flows a *moſt thin* Liquor from ſuch a *wound*, not being in the leaſt degree *red*, becauſe the *rupture* or *aperture* is ſeldom made ſo large, as to be able to tranſmit the *red Blood* globules, and we ſuppoſe that there are ſuch *Acrids* as can in no wiſe *diſſolve* thoſe globules.

X. Hence a Tumour and Inflammation may ariſe in the place and neighbouring parts; for the Liquid being *preſſed* by the Heart, and *forced* into the *ſides* of the Veſſel, will urge thro' it all it's particles, which anſwer to the aperture, and theſe parts preſſing the *neighbouring ones* will excite a Tumour and Inflammation in them: thus we obſerve in ſeveral Diſeaſes, 1. That *pain* ariſes from a *puncture* of *acrid* particles; for *pain* is nothing elſe than a *ſeparation of the parts of a nervous fibrilla, cauſed by the force of an acrid particle*; and this ſeparation is immediately followed by a Tumour, on the riſing of which, or, which is the ſame thing, on the flowing out of the Liquid, the *pain* ceaſes; as may be obſerved in the Gout, Tooth-ach, &c.

XI. The Liquids which ſtay there and *ſtagnate*, follow their own nature, that is, putrify by *ſtagnating*, become *acrid*, and afford a *volatile alkali*: and that *Acrimony* of the Liquids renders them fit to *diſſolve* our Veſſels. Now this *law* obtains in the Urine, Blood, Serum of the Blood, but not in the Lymph; for we ſee that *hydropic* Perſons have their Belly filled with a *Liquid* diſtilling from the Lymphatic Veſſels, but yet without any *gangrene ariſing* in the contents of the Abdomen.

XII. Laſtly it appears from what has been ſaid, that *acrid* Medicines produce their effects on our

Bodies, *partly* by the *force* of their own *acrid* ſubſtance and figure, and *partly* by the *force* of the Fluids ruſhing againſt the *acrid* particle: for when the Liquid is *at reſt*, there follows no effect, how fit ſoever the Medicine may be to produce any effects; for a *knife* applied to the Finger, tho' it be fit to cut, yet will do nothing unleſs it be impelled and excited to act: and thus an *Acrid* is brought into *action* by the tremulous motion of the Liquids. Hence therefore Medicines *act*, *both by the efficacy of their own ſubſtance, and by the effect of the vital Liquid*; which *effect* depends firſt on ſome Medicines.

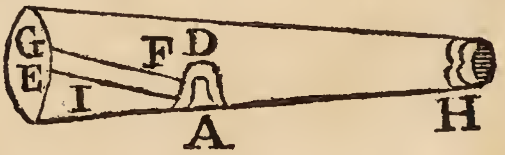
CHAP. VII.

Of VISCIDS.

1. A *VISCID* is that which *tenaciouſly* adheres to the ſides of a Veſſel, but ſo as not to be able to *penetrate* it, on account of the breadth of it's ſurface; for if it was of ſo ſmall a ſurface as to be able to *perforate* the ſides of the Veſſel, it would be reckoned amongſt the *Acrids*.

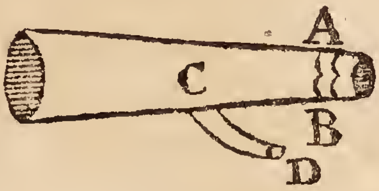
2. A *Viſcid* may adhere to the ſides of the Veſſels *two ways*, 1. it either touches the ſides only in one *part*, as A; 2. or it touches the ſides *all round*, as the particle H. The effect of this *Viſcid* in *both* caſes is ſhewn in the annexed *figure*: let A D be a *viſcid* particle ſo *tenaciouſly* adhering to the ſide of a Veſſel, at A, as not to be thence removed by a Liquid preſſing *behind*, and running according to the lines E I and G F, it will ſuſtain the whole *force* of the Liquid flowing in, that was to be ſuſtained by the part of the ſide contained between A H, and therefore the part of the ſide, to which the particle ſticks, will *recede* toward the outward parts, as being more *preſſed* than the other parts of the ſame ſide, and the more it *recedes*, with the

greater force will it *reſtore* it's ſelf; whence the *harmony* or *balance* of the *oſcillatory motion* is taken away in that Veſſel: hence ariſes an *obtuſe pain*, which is perceived in almoſt all diſeaſes ariſing from a *Viſcid*, for it ariſes from preſſure. Let us ſuppoſe now in the ſecond place, that the *viſcid* particle H adheres in ſuch a manner, as to touch the ſides of the Veſſel *all round:* it's effects may be conſidered, either with regard to the Veſſel to which it ſticks, or with regard to the *lateral* Veſſels; with regard to the former, it's effect will be the *total obſtruction* of that Veſſel, and at the ſame time the *diſtenſion of the ſides*; for the particle will be propelled by the Fluid urging behind till there is a *balance* between the *force* of the Liquid, and the *power of reſiſtance* in the ſides of the Veſſel; *which* being once *effected*, the particle will remain *unmoved*, quite *ſtopping up* the cavity of the Veſſel, and at the ſame time *diſtending* it's ſides: but that there will at laſt be a *balance* between the *force* of the Fluid and the *reſiſtance* of the ſides, appears from hence, that the *force* of the Fluid is continually diminiſhed, and the *reſiſtance* increaſes; and that the *force* of the Fluid is diminiſhed appears from this, that the *farther* it recedes from the Heart, the *ſlower* it is moved; but that the *reſiſtance* of the ſides is increaſed, is manifeſt from the cavity of the Veſſel being always more and more diminiſhed in it's progreſs, or the diſtance of the ſides being always made leſs: for the narrower part of a *conical* Veſſel cannot be *extended* to the ſame amplitude as the larger portion, unleſs a greater force is applied.



3. Thus much of the effect, which a *viſcid* particle has on the Veſſel it's ſelf to which it is faſtned; let us ſee now what it will do with regard to the

lateral Veſſels. A *viſcid* particle A B *faſtened* to a Veſſel, and *ſtopping it up*, hinders the Fluid from paſſing thro' it; wherefore the Fluid verges towards the lateral Canal C D; but it can by no means *enter* it, without *dilating* it at the ſame time; from it's *dilatation* therefore the *contractile power* of the ſides is augmented, and conſequently the *oſcillatory motion* becomes more vehement, and thence the *courſe* of the Fluid more ſwift: and hence it is, that in Fevers, the *heat* immediately ſuceeds the *cold.*



4. From what has been ſaid it appears, that the greateſt *changes* in the Body ariſe from the Fluids, ſo far as they *impinge* upon the Solids, and deſtroy them; but not from the Solids, as the *firſt* cauſe *affecting* the Fluids.

CHAP. VIII.

Of the nature of our Fluids, and eſpecially of the Blood.

1. ALL the humours in our Body derive their original from the Blood; we muſt therefore firſt inveſtigate the nature of it, before we can pretend to underſtand it.

2. All the Liquids that flow in our Body, are ſubject to this law, that being *moved* from one part to another they at length return to the Heart. Now that Liquid which remains for a moment in the Heart, is called the Blood, which is thence diſtribu-

ted into all the parts of the Body, where it is received in order to perform the different Secretions; for the Blood conſiſts in *heterogeneous* parts, as *Fat*, *Bile*, *Water*, &c. which are only ſeparated and changed: whatſoever therefore is to be ſeparated in the Veſſels of the Body, muſt be ſeparated from the Blood. Moreover the ſubſtance of the Blood may be diſcovered by ſeveral artifices; but becauſe thoſe which are *ſimple* are more eaſily underſtood, I ſhall begin with them.

3. We perceive by our ſenſe, that the Blood in all Animals, Men, Quadrupeds, Fiſhes, Volatiles and Reptiles is the ſame, and that it conſiſts of theſe *three parts*; 1. Of an almoſt inſipid *Water*, with a very little ſcent, which being expoſed to the Fire flies off in vapours, yielding a fetid odour, colouring, and diſſolving all ſimple and compound Salts, as alſo muriatic Acids: whence it follows that it is not *ſpirituoſo-ſaline*, as ſome Chemiſts would have it, for *Spirits* diſſolve *Oils* only and not *Salts*; beſides all *Spirits* are produced, either by Fermentation, as the *inflammable*, or by Putrefaction, as the *ſaline*; laſtly this *Water* of the *Blood*, as well as *common Water*, freezes into *Ice* by the power of cold, and is again reſolved into a very pure *Water* by Heat; but *Spirits* elude the moſt intenſe power of cold, as we ſee in the moſt *ſpirituous* Liquors; 2. Of that part which is called the *ſerum* of the Blood, and is a Liquor, that is not *red* in it's *natural* ſtate, but *tranſparent* and *yellowiſh* when diſturbed; and is not eaſily congealed by the power of cold, but being expoſed to the heat *hardens* like the white of an Egg, the more watry part flying away; 3. Of that part which gives a *redneſs* to the whole, and which is reduced by the power of heat no leſs than of cold into a red, firm, tenacious maſs, called the *inſula*, if the Blood drawn out of the Body

is ſuffered to reſt for ſome time in any Veſſel, firſt the *watry* part flies off, as being the moſt ſubtile, and then the *Serum* is ſeparated; and the more plentifully this is done, the *inſula* becomes the ſmaller, and in three or four days the *red* part quite diſappears, being turned into *Serum:* and that *Serum*, if the Blood be taken from diſeaſed Bodies, is ſometimes of a *black*, *yellow*, or other unnatural colour. Theſe things are obſerved by the naked Eye, but by the aſſiſtance of Microſcopes we farther diſcover, that the Blood conſiſts of *ſpherical* particles ſwimming in a limpid Fluid, which in the greater Veſſels retain their *ſpherical* figure, and appear *red*, but towards the *narrow* parts of the Veſſels become oval, and turn from *redneſs* to *yellowneſs*; beſides it is found, that every *globule* conſiſts of *ſix other ſmaller ones*, and each of theſe *of ſix other*, and ſo on; which being ſeparated from each other, their *red* colour immediately vaniſhes. That ſeparation is made only in the *ſmalleſt* Veſſels, and ſeems to be inſtituted for this purpoſe, that the nervous Juice, and moſt ſubtile Lymph may thence ariſe: now this ſeparation of the *globules*, which is followed by the diſappearance of the *redneſs*, may be procured by *vehement* Medicines.

4. FROM what has been ſaid it appears, that heat is not the cauſe preſerving the *equal fluidity* of the Blood: for heat thickens the extravaſated Blood; and beſides it remains *fluid* in Fiſhes, whoſe Bodies are cold; and yet it grows *grumous* when extravaſated, no leſs than human Blood. Hence the Cauſe preſerving the *fluidity* of the Blood is not any thing peculiar to the Blood; for if it aroſe from the nature of the Blood, it's *fluidity* would then be greateſt, where the greateſt *quantity* of Blood is, that is, in the *greater* Veſſels; but in *them* the *fluidity* is leſs than the *motion*; for in thoſe the greateſt Coagu-

lations are wont to happen, as is manifeſt in the Veins of Carcaſſes. For our Liquids concrete when the heat is *abſent*, but this *defect* of heat happens from the *motion* of the Fluids being at the ſame time *deficient*. Therefore the *action* of the Solids thro' which the Blood *flows*, is the cauſe of it's fluidity; but when the *action* of the Solids ceaſes, the *motion* alſo of the Blood ceaſes: and this is confirmed by the following experiment, if in the winter ſeaſon, the Arteries of a torpid *Frog* or *Bat* be viewed thro' a Microſcope, their Blood will plainly appear concreted into *grumes*; and tho' the *Animal* be brought near the Fire to be warmed, yet that *grumous* Blood will not be reſolved or removed, 'till the Heart begins to *contract* it's ſelf; but when that is put into motion, the Blood alſo will be moved, and at length after ſeveral pulſations of the Heart will recover it's former *fluidity*, ſee LEWENHOECK. Hence we muſt conclude, that *heat* is a *concurrent* cauſe of the *motion* of the Blood, but not the *primary*, becauſe on the ceaſing of the *action* of the Solids, the *motion* and *heat* ceaſe alſo. This examination being made, let us now conſider the properties of the Blood.

5. THE properties of the Blood are either *general*, that is, ſuch as agree with other Liquids; or *ſpecial*, which agree only with ſome, and are therefore to be ſought from the nature of every *ſpecial* Liquid. All the properties that agree with a *general* Liquid, are found alſo in the *ſpecial*: and theſe two depend on mathematical rules. The *general* properties are, 1. That the Blood like every other Liquid, more eaſily ſuffers ſome parts to be *taken* from it, than the whole maſs to be *moved*. 2. That it has thoſe conditions, which are neceſſary to *fluidity*; namely (α) the greateſt fineneſs of parts with relation to our ſenſes, that is, that the parts

are ſo ſmall, that any *one* of them eſcapes our touch and ſight; (β) the coheſion between the parts is ſo *ſlight*, that they may moſt eaſily be ſeparated. (γ) An *equal* gravity of all the parts. Now from that gravity of *each* of the parts reſults the gravity of the *whole* common *matter:* hence becauſe all the particles are *heavy*, they *ſuſtain* themſelves equally; for the preſſure and gravity of the whole matter ariſes as well from an endeavour to deſcend, as from an *equable* gravity of the particles. (δ) The *projectile* motion; by which a Fluid is carried by the preſſing ſide of the Veſſels towards any point. And theſe are the *general* properties of Liquids.

6. All the Liquids circulating in our Body proceed from the Heart, in which they are much more *ſpirituous* and *aqueous* than in the reſt of the Veſſels; for from *ten ounces* of Blood taken immediately out of the Heart, more than five ounces of ſimple *Water* may be ſeparated; whence it is manifeſt that the Blood is in the greateſt proportion compounded of *Water*. This *aqueous* part ſuffers a change proceeding from three cauſes, namely, from *two* ſorts of Salts, Animal and Vegetable, from the *ſerous* and ſpirituous part, and from the *red* part increaſing by heat. The bulk of the laſt and ſmalleſt particles of Water cannot be determined; for they are as *pellucid* as Air; and therefore eſcape our obſervation by Microſcopes; and they are ſo *ſmall*, as to paſs even thro' the *inviſible* pores of Plants; nay the *machina Boyleana*, or Air-pump, ſhews that they can paſs thro' pores that are *impervious* even to the Air: whence we infer that the greateſt part of the Blood is moſt fit for motion on account of it's *fluidity* and *fineneſs*. The gravity of Water with reſpect to Air is about as 1000 to 1; but before we explain it's *proper* faculties, we muſt ſhew what are the properties *peculiar*

to our Liquids; and theſe are comprehended in the four following *heads*, or rather depend upon them and are inferred from them. 1. Every particle of our Fluid has it's own *proper* and *determinate* Bulk, Figure, and Solidity. 2. Every particle has it's own *determinate* force or *momentum*, by which it reſiſts it's own ſeparation from the particles to which it adheres, and tends toward Concretion. 3. Every particle has it's own *ſpecific* gravity. 4. There are various degrees in our Liquids, of the *projectile motion*, by which they are urged to flow in a right line. Moreover as to the properties of Water, it is to be obſerved, that the *volatile Salts* of Animals ſwimming in Water are lighter than the Water; for when they are drawn out, the Water becomes *heavier*, with regard to it's bulk: but on the contrary, when it is mixed with *other Salts* it grows *heavier*; and the more of *theſe Salts* is mixed, the more is it's *fluidity* diminiſhed, and at laſt it *concretes* with them. Thence it appears, that Water, which is the greateſt part of our Blood, is *changed*, as to it's *gravity*, chiefly by *ſaline* particles ſwimming in it; for thus the more rigid and ſolid thoſe parts are, the *heavier* is the Water made and the fitter for motion: hence alſo from the *Salts mixed* with the Water of our Blood arise various changes in it.

7. With regard to the *four juſt mentioned heads*, the Fluids of our Body may *variouſly offend*. And therefore, as to the *firſt head*, 1. with regard to the *Bulk*, and that *two ways*; for they may be either too *thick* or too *thin*: therefore Medicines which are proper in either of theſe ſtates of the Blood, are ſuch as are *reſolvent* and *coagulating*. If any *healthy* Body becomes *diſeaſed* becauſe the particles of Blood are too *thick*, the cauſe which produces the *diſeaſe*, will be neceſſarily *internal*, and not *external*;

ternal; for whatſoever enters into the Heart, is carried thither from the Veins; and what goes out paſſes by the Arteries; but whatſoever enters the Veins, flows into them either from the Lacteal or Lymphatic or Abſorbent Veſſels: but the orifices of thoſe Veſſels are leſs *open*, than the *confines* of the Artery and Vein, or the *plexus reticularis*, thro' which the Blood paſſes out of the Arteries into the Veins, as we ſee by the Microſcope; and therefore the particles brought into the Veins thro' the orificies of the Lacteal and Abſorbent Veſſels, and from thence into the Heart, are ſo *ſmall*, that they cannot hinder the *fluidity* of the Blood by their bulk: and LEWENHOECK has obſerved, that the particles of Chyle and of Lymph are much *ſmaller*, than the *red* parts of the Blood: in this reſpect therefore there is no ſort of food that can of it's ſelf be hurtful to a ſound Body; ſeeing the too *thick* parts of it can by no means enter the Lacteal and Abſorbent Veſſels: and therefore this *fault* ariſes from a mere *internal* cauſe. Moreover as the bulk of the particles is too much *increaſed*, the fault being in our Body, when they come to the *laſt* Veſſels, they cannot *go through*; this therefore would continually happen, if the Lungs, by their *preſſure* made by the Air, did not *break* thoſe adhering particles, till they were able to paſs thro' the *fineſt* Veſſels. Thus there are *two* effects of particles too much *increaſed*, 1. An obſtruction of the circulation of the Liquids, 2. A deſtruction of the ſecretion of thoſe humours which ought to be ſecreted: all the cure therefore of the *bulk* being increaſed regards the ſecretion and circulation. Therefore, as the Veſſels ariſe *two ways* from the Arteries, either *directly*, as the Veins, or *obliquely* or *laterally*, as the Glands or ſecretory Veſſels, which are leſs than the Arteries and Veins, if the particles of Blood become *thicker than uſual*, then thoſe which ought to be ſeparated can by no means enter the *orifices* of the Glands, but go directly into the Veins; and ſo the ſecretion is loſt, and the ſecretory Veſſels, becauſe of the defect of the diſtending Liquid, collapſe: but if the *thickneſs* of the particles be ſo great, that they cannot enter even into the Veins, then the circulation is hindered; whence ariſe various *diſeaſes*, and at laſt *death* it's ſelf. Every Medicine therefore, which is applied to cure the *increaſed* bulk of the particles, muſt be *ſuch* as can divide the *moleculæ* of the Blood in the ſmall Arteries near the ſecretory Veſſels: wherefore if there are any that diminiſh the globules of Blood, the moſt efficatious are *Mercurials*, and *Salts*. The principal diſeaſes, which ariſe from this fault, are the *Dropſy*, and all *inflammatory* diſeaſes.

The particles of Blood are ſaid to be too much divided, when they are reduced to ſuch a *ſmallneſs*, as to be quite unable to ſupport life and health. The cauſes of this *fault* are *two*, one *external*, the other *internal*, which may be any too diſſolving Liquid. It's effects may be of *two* ſorts, the *acceleration* of the circulation, and the *withering* of the ſecretory Veſſels. For, 1. the Blood when it is too much *divided* as to the bulk of it's particles, can paſs more eaſily out of the Arteries in the Veins, than it can into the *lateral* Veſſels; and therefore throws it's ſelf into them in greater plenty: but thence the Veins are more *dilated*, and the more they are *dilated*, the more vehemently they *contract* themſelves; whence follow an *acceleration* of the circulation, a greater *attrition* and *heat* of the parts, a *ſubtiliſing* of the Blood, and an *eruption* of it out of it's Veſſels. 2. When in *this ſtate* of the Blood none, or at leaſt very few particles enter the *lateral* Veſſels, they are no longer extended, but are dried, coaleſce, and at laſt become *fibrous ſtamina*; whence follow a *Phthiſis*, *Leanneſs*, and various *chronical* diſeaſes: therefore the fitteſt remedies to correct this *fault* of the Blood are *coagulating* Medicines, ſuch as the *terreſtrial*, alſo *abſorbents*, *&c.*

8. THE *fault* may be, 2. in our humours with regard to their *figure*, and in this manner the particles of the Blood are ſaid to offend *two ways*; for either they are too *acrid*, or too *viſcid* and *obtuſe*; tho' indeed their *obtuſe figure* produces no ill effects, and therefore ought not to be eſteemed a *fault*. The *figure* indeed alone *determines* a Body; and the Body may be ſaid to be *moved* more and more as it can perform it's effects in *one* point: the *figure* alſo ought to be conſidered, with regard to *Solidity*, ſo a Body *as to it's figure*, acts only on the Solids; but an *obtuſe figure* falls upon them as we have already demonſtrated; whence the above-mentioned effects ariſe. But now *obtuſe figures* are, 1. Bodies taken in, 2. Such as are made ſo in us, as a *long piece of Wax* by being preſſed by our Fingers becomes *round*: now theſe *obtuſe* Bodies in us are not very rigid, but rather mild. the *acrid* particles in our Blood proceed from two origines, for either they are derived into our Blood *from without*, or are generated *in it*. Thoſe which come *from without* either enter by the Lungs, or by the Gullet, or elſe are let in by the outer Skin, or by the Abſorbent Veſſels, as Cantharides, Mercurials, *&c.* Thoſe which enter by the Lungs are very *hurtful*, as being the moſt ſubtile, the moſt *ſolid*, and almoſt *immutable*, on account of the ſtructure of the Lungs: thoſe which enter by the Gullet, are either contained in our *food*, or are *venemous Minerals* taken in, which are the *worſe* as they are *harder*; for then they cannot be altered in the Body: but all parts that paſs thro' the Skin are very *hurtful*, and are indued with greater *ſubtilty*,

as we learn from Cantharides and Mercury. The *acrid* particles which are generated in the Blood, are thoſe which becauſe of their too vehement *attrition*, from *obtuſe* and *viſcid* become *acrid:* but that *attrition* happens from *two* cauſes, 1. From the Liquids *ſtagnating*, and thence contracting a *putrid* ſtate; 2. From the Liquids being too vehemently *circulated*, without the mixture of any milder Liquid. The *firſt* appears from various experiments, for if the Blood of a healthy Man be kept ſome days, as five for inſtance, in a Veſſel, it becomes *fetid*, very *acrid*, and quite *urinous*; whence it is manifeſt that the Blood *putrifies by ſtagnating* in the ſame manner as Water: this *putrefaction* is promoted by the application of *heat* or *warmth*; for by this means the particles are put in motion, whence it comes to paſs, that by acting on each other they become *acrid:* but if the motion be too *violent*, then the more *aqueous* particles being exhaled, thoſe which remain *coaleſce*, as if they were condenſed by *cold.* Hence *Schirrhuſes* ariſe from too much *heat* as well as *cold*; but *Putrefactions* ariſe in our Body from too *violent* a motion. But that the particles of Blood contract an *Acrimony* from too violent a circulation, is manifeſt even from this, that if a *healthy* Man, who takes no food but ſuch as is *mild*, whoſe Evacuations and Retentions have nothing of *Acrimony* in them, but are quite *inſipid*, is ſiezed by a *burning Fever*, his Blood ſuffering a great *preſſure* and *attrition* by the *accelerated* motion of his Heart, and by the paſſage of it thro' the *ſmalleſt* Veſſels being *obſtructed*, will become more and more *acrid*, eſpecially if *diluting* Medicines are not adminiſtred; 'till at laſt it comes to that degree of *Acrimony*, as to *eat* thro' the Veſſels, and produce *Aphthæ* and internal inflammations, not to be cured without a great quantity of *Diluents*. Hence the ſame *evils* flow from too *accelerated* a circulation, as uſe to ariſe from *acrid Poiſons* taken in: but the ancients being ignorant of the circulation, and therefore not being able to explain this cauſe of Diſeaſes, called it τὸ Θεῖον, that is, ſomething *Divine.*

9. A *Fault* may ariſe, *thirdly*, in our Liquids with regard to *Solidity*, and in this reſpect the particles of Blood *offend two ways*, either by *exceſs* or *defect*; but before I treat of theſe, I muſt ſay ſomething of *Solidity* in general. By *Solidity* I underſtand that property of the Body, which is properly oppoſed to *Vacuity*, and every Body is thought to be the more *ſolid*, the ſmaller and fewer *pores* it has that are intercepted between it's particles. For it is found by experience, that the *gravity* of the ſame Bodies is always proportional to their *Solidity*, ſo that, if two Bodies are equal in *magnitude*, but different in *weight* there muſt neceſſarily be more void *pores* in one than in the other. Beſides it muſt be obſerved that no Body can be *mathematically ſolid.* The more ſolid Bodies preſerve their motion longer, than thoſe which are leſs *ſolid* ; the cauſe of which is, that the *force* reſiſting their motion, and ariſing from the ambient *Fluid*, the reſt being equal, always anſwers their ſurfaces; wherefore, as in a more *ſolid* Body, there are more particles of matter under the ſame ſurface, than in a leſs *ſolid* Body, it plainly follows that the more *ſolid* Bodies are more difficult to be *ſtopped*, than thoſe which are leſs ſo. But what has been ſaid concerning *Solidity in general* may be ſufficient at this time; conſidering what has been ſaid in CHAP. I.

THE effects of particles that are too *ſolid* on the Blood are *two* ; *the too great ſubtiliſing of the Blood*, and the *diſturbing of the oſcillatory motion.* For 1. The too *ſolid* particles when driven from the Heart, acquire a greater motion than the reſt; for the *quantity* of motion of any Body ariſes from the *velocity* drawn into the bulk; wherefore they forſake thoſe particles, in the company of which they were driven out, and *impinge* upon others, and by this *Impetus* diſſolve them and render them too ſubtile. 2. Our Fluid when driven from the Heart *impinges*, in lines with very acute angles, againſt the *ſides* of the Veſſels: but if this is done every where *equally*, then the Veſſels are diſtended equally. But if one line *impinges* with *greater* force than another, then the *oſcillatory motion* is diſturbed (ſee the *laſt* THEOREMS of CHAP. V.): but this will neceſſarily happen, if the particles contained in any line are too *ſolid*; for hence the Veſſels will be extended and enlarged, and the courſe of the Liquid will be diſordered: whence often *Polypuſes* and other *obſtructions* are wont to ariſe. But the origine of theſe particles is external, or particles that are too *ſolid* come from without. The remedies of *heavy* or *ſolid* particles muſt conſiſt of *moleculæ* as *heavy* as the particles of our Fluid: and as the particles of Animals and Vegetables, to the laſt degree *reſolved*, are almoſt of the ſame *gravity* with our Fluid, or as 5 to 6, ſo by the uſe of them a Body will be preſerved in a *healthy* ſtate, and recover it again, if it is once loſt: but thoſe which are *more heavy*, as *Phoſphorus*, and *thick Oils* drawn from Animals, *fixed Salts* extracted from Vegetables, *metallic Acids*, and alſo ſome of the *heavier Sulphurs*, produce the above-mentioned effects of Solidity, namely *Corroſion* and *Extravaſation*, whence *inflammatory* diſeaſes ariſe: and therefore they are to be avoided in that ſtate of *diſeaſe*. The other *fault* of the Particles of Blood with regard to *Solidity*, is, that they are not ſo *ſolid* as they ought to be, and this depends on *Diminution*, which is an increaſe of the *ſurface*, and an aggregate of the *ſmalleſt* particles, by which the *points of contact* are multiplied. The effect of this *fault* is *ſluggiſhneſs*, or an inaptitude to motion, or an incapacity in thoſe particles of moving others that are more *ſolid:* whence follow *Lentors* and *Coheſions*. For *ſluggiſh* Bodies have a *leſs* motion and a *greater* reſiſtance, and are therefore incapable of moving other *more ſolid* Bodies. But the effect of *ſluggiſhneſs* in our Body, is a *leſs action* of the Fluid upon the Solid, and of the Solid upon the Fluid. Now the Liquids in our Body preſerve their *Fluidity* after *two* different manners; 1. on account of ſome *diluting* liquid Body, 2. by an external cauſe *dividing* the parts. But the cauſes which produce this *ſluggiſhneſs*, or impotence and inaptitude to motion, whence *Coheſions* and *Lentors* ariſe, are not ſo many as is commonly imagined; for our Body is ſo conſtituted, and it's Veſſels are ſo *ſmall*, that they admit none but the *moſt minute Moleculæ*; but the *moſt minute* Bodies are always the moſt *ſolid*, nor can they be any farther *divided*, without uſing the greateſt labour; hence they long retain the *bulk* they have received, and do not eaſily *coaleſce*, becauſe of the narrowneſs of their ſurface.

CHAP. IX.

Of the Faults in the whole Maſs of Liquids, conſidered together.

1. HAVING now finiſhed the *Hiſtory* of the particles of our Fluid, let us apply ourſelves to the conſideration of the whole Maſs. For any Body to obtain the name of a Fluid, it is required,

quired, 1. That it be divided into very *minute* particles, 2. That thoſe particles may be with the greateſt eaſe *ſeparated* from each other, and that no *coheſion* remain. Moreover our Fluid may offend two ways; namely, 1. by too great a *coheſion* of it's particles, 2. by too great a *diſſolution* of them. Too great a *coheſion*, which is otherwiſe called a *Lentor*, may ariſe either from too great a *magnitude* of each particle, or from too great an endeavour in in the particles to cohere. If this *lentor* happens in the *greater* Veſſels, in the Auricles of the Heart, or in the Ventricles of the Brain, a *Polypus* is ſoon formed; which is a ſolid Maſs reſembling Leather; and the more *ſolid* the *longer* it has continued: there is often found a *polypoſe* ſubſtance in the *Heads* of thoſe who have been *hanged*; for in them the Blood, having it's reflux thro' the jugular Veins obſtructed, regurgitates into the *lateral* Canals; and theſe are too *narrow* to tranſmit the whole *Maſs*; whence it happens, that only the *finer* part paſſes, the *thicker* being repulſed, which as new Blood arrives, *obſtructs* thoſe Canals. If there happens a *lentor* in the *ſmaller* arterial Veſſels, there ariſes an *inflammation*; which is accompanied by *pulſation* and pain: the *pulſation* ariſes from the *thickening* Blood, which ſtops in the little Arteries, being *protruded* by the Blood that preſſes behind: and the *pain* ariſes from the ſides of the Veſſels being very much *diſtended*, which gives a ſenſation of *pain*: in this caſe the *finer* part of the Blood ſtopping in the ſmall Arteries ſometimes exhales thro' the *ſmalleſt lateral* Veſſels, that is, if they be not obſtructed; for otherwiſe this *more liquid* part of the Blood *putrifies*, whence *Puſtules*, *Gangrenes*, *&c.* but if the *lentor* is in the broad or firſt Orifice of the Lymphatics, a kind of *gypſeous* or hard Matter is there collected, for the reaſon juſt now mentioned, namely, becauſe the *more liquid* part flows thro' the *lateral* branches, which here are in plenty; hence the *Polypus* becomes *white*: but if it be protruded to the extremity of the Lymphatics, a *Dropſy* and *Œdema* ariſe, the Veſſels being diſtended by their own pellucid liquor; and if they burſt, then comes a *Leucophlegmatia* or *Anaſarca*; and as the humours alſo frequently ſtop and ſtagnate, and ſo contract an *Acrimony*, there ariſe *Impoſthumes* and *Gangrenes*: but if this *lentor* remains in the extremities of the Veſſels, there is a muddy and turbid *Maſs* ſecreted, which by *putrifying* diſſolves the Veſſels, and produces a *Conſumption* and it's effects. But if the *lentor* is in the nervous Veſſels, then ariſe thoſe diſeaſes which are *peculiar* to the Nerves; and perhaps alſo an *Apoplexy*, and deprivation of the *Senſes*: but that ſeldom happens, becauſe the Spirits or Liquid of the Nerves can never be concreted by the power either of *heat* or *cold*, on account of their almoſt immutable Solidity: but the *external* Nerves are affected, when they are preſſed by the Arterial Veſſels being too much diſtended; whence ariſes an *inſenſibility*, and often an *immobility*.

4. THERE are various cauſes of a *lentor* in our Liquid. The firſt is the *exhaling* of the *more fluid* part, hence the Blood remains *fluid* in the Veins, ſo long as the Lymphatic Veſſels are diſcharged into them. Now the remedy for this diſorder is the reſtitution of the Liquid *flown off*. The ſecond cauſe is any degree of *heat* exceeding the *natural heat* of our Body; the quantity of which may be known by the help of the Thermometer: this *heat thickens* the Blood by evaporating the *finer* and *ſpirituous* parts; and indeed ſuch a *lentor* can by no art be removed, ſo long as the *heat* remains, not by *Spirit of Salt*, nor by *Oils*, nor by any thing

elſe of that kind; for the *heat* carries off the *finer* parts, even tho' the Veſſels remain *ſhut*, as appears in the *digeſtion* of Blood; thence we ſee that the *effect* of all too *hot* cauſes in the Blood, within the Body, is inſpiſſation. Hence in all *inflammatory* diſeaſes, as in the *Small Pox*, *&c.* too great heat is to be carefully avoided. The ſame effect of *heat*, namely *inſpiſſation*, obtains in all our Liquids, except the *excretory*, as Urine, Sweat, *&c.* and ſome that are *ſecretory*, as the Pancreatic Juice, Bile, Spittle, Mucus; which indeed in ſome meaſure *coaleſce*, but are eaſily *diſſolved* again. The third cauſe is immenſe *cold*, by which Water, and alſo our Liquid may be congealed: for if the Blood of a *healthy* Man be expoſed to the *coldeſt* Air, the *thick* part will be ſeparated into an *Inſula*, and the *aqueous* or *ſerous* will be turned to *Ice*, as is ſeen in Men who have periſhed by *cold*; but yet it is not eaſy to congeal all the *ſecretions* of the Blood, for the aqueous humour of the Eyes is *never congealed*; and the Bile and Serum not without *difficulty*, but the Spittle may be *eaſily congealed*; and the Urine preſerves it's *ſpirituoſo ſaline* part *fluid* in the middle, whilſt the *aqueous* part is congealed. Surpriſing diſeaſes depend on this cold: thus we obſerve, that *frozen* fleſh grows *putrid*, when thawed by *heat*; for by this means the natural *connexion* is diſſolved, and the Liquid becomes a *volatile alkaline* by this *obſtruction*; nay in *Norway*, Men are ſometimes ſeized in ſuch a manner by the *cold*, that their Noſes fall off when they go to blow them: and this Diſeaſe proceeding from *cold*, is principally called the Scurvy. The fourth cauſe is a reſt brought upon the humours, which produces a *coagulum* in all of them, eſpecially thoſe which are *Arterial*: for if a Man in the moſt perfect ſtate of *Health* is ſiezed with a ſudden *fear*, a *paleneſs* and *coldneſs* will immediately ariſe, and if the paſſion is vehement, and endures a long time, then a *Stupor*, a *defect* of Liquid in the Brain, and a *privation* of motion; whence come *obſtructions* or *coagulations* of the humours in ſome of the Bowels, which if they happen in the Heart, cauſe a *palpitation*; and this is wont to happen in thoſe who are ſubject to frequent *faintings*; for after they have lain for ſome time, perhaps a quarter of an hour, deprived of *ſenſe* and *motion*, when they begin to recover, they generally perceive *anxieties* about the region of the Heart, and for the moſt part at the Pulmonary Artery; for the Heart at that time, having it's motion *accelerated*, and as it were *reduplicated*, endeavours to throw out a great *quantity* of Blood that *ſtagnates* in it's Ventricles, and neighbouring Veſſels, and hence ariſes the *palpitation*; becauſe of the plenty of Blood that *comes*, and the *difficulty* of throwing it all out: but if it cannot get rid of that Maſs of Blood, then a *Polypus* ariſes, and at length *Death* itſelf. The fifth cauſe is the admiſſion of many particles that *coagulate* the Blood: thus all *Acids*, *diſtilled* from Minerals by a violent Fire, *coagulate* the Blood on a ſudden; *Spirit of Salt* more ſlowly, *Spirit of Vitriol*, of *Nitre*, and of *Allum*, moſt quickly and ſtrongly, which, if they are injected into the Veins, immediately *coagulate* the Blood, which, on account of the laxity and amplitude of the Veins, being carried into the Heart and Pulmonary Artery, ſoon ſuffocates the Animal (*a*). But it muſt be obſerved, that all *Acids* do not *thicken* the Blood; for *Nitre*, and *Marine Salt*,

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(*a*) On this occaſion it is worth the Reader's while to conſult the late learned Dr FRIEND's Experiments, in his *Emmenologia*, *cap.* 14.

dilute it, and Vinegar alſo, (*b*) and other *acid* Spirits of Vegetables; but *Alkaline Salts* ſometimes thicken it, ſometimes dilute it; but of theſe Spirits ſome coagulate it, as *Spirit of Wine*, which, tho' it is accounted by ſome a very fine *diluter*, yet being *injected* into the Veins, *coagulates* all the Vital Liquid. The ſixth and laſt cauſe is too great a *motion*, and alſo an *obſtruction* in the *ſmalleſt* Veſſels: for in every obſtruction of an Artery, the Veſſel is *diſtended*, and at length *burſten*, if the obſtruction continues; whence follows an *extravaſation* of the more *liquid* part of the Blood. This aptitude, or proclivity to form a *coagulum*, is not any thing *morbid*, but a property inherent in the Blood in a *healthy* ſtate: for experience ſhews, that the more healthy a Man is, the more quickly and eaſily does his extravaſated Blood acquire a *lentor*; when on the contrary, moſt *diſeaſed* Perſons have their Blood very *fluid*, eſpecially thoſe who are *leucophlegmatic*; nay the Blood of ſome Men does not *coaleſce*, even in the agonies of Death. Every cauſe which *acts* moſt vehemently upon the Blood, promotes that *concretion*. For thoſe who uſe violent exerciſe, and move their *Muſcles* very much, have *thick* Blood. Moreover too great *Excretions* and *Evacuations thicken* the Blood in the *greater* Veſſels, whence there happens a *Subſidence* in the *ſmaller* ones, and hence an *Atrophy*; becauſe the Liquid does not enter into the *lateral* Lymphatics: but when any ſuch thing happens in all immoderate *evacuations*,

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(*b*) But this muſt be underſtood only of their being taken by the Mouth in a *moderate* doſe, and of ſuch *Spirits*, not *concentrated*, but diluted and ſimple (compare Chap. vii. § 3); for otherwiſe they *inſpiſſate*, nay and *coagulate* the Blood; as is proved by Dr Friend's Experiments, concerning *Vinegar* injected into the jugular Vein of a Dog, *&c.* See his *Emmenologia, cap.* 14. *ſub finem.*

it is no wonder that thoſe ill conſequences ſhould follow.

3. THUS far of the too great *Tenacity* of the Blood, in the next place we muſt conſider it's too great Fluidity; but as this depends on the too great *fineneſs* of it's parts, which was ſpoken of before, it is not neceſſary to ſpend much time in explaining it: it may be ſufficient to obſerve, that *Fluidity* may be induced into our Blood, if there be occaſion, by the power of *volatile Salts*, extracted from Nails, Horns, Marrow, and other parts of Animals; nay and *Water* taken in a ſufficient quantity excellently *reſolves*, *attenuates*, and *dilutes*; as alſo the acrid *Woods* of *Guaiacum*, *Saſſafras*, &c. and all *fixed Salts* of Vegetables and Minerals, eſpecially Metals, which are *better* as they are *heavier*; hence if *Gold* could be rendered *fluid*, without any diminution of it's *weight*, or increaſe of it's *bulk*, it would be the beſt *diſſolvent*, and this is what is extolled under the name of *Oleum* TH. PARACELSI (*c*).

CHAP. X.

Of the Gravity of the Blood.

THE *Gravity* of Bodies is nothing elſe than their *endeavour* to deſcend toward the centre of the Earth; and it is always *proportional* to the *Solidity* of Bodies. Whilſt the Blood is circulated in the Body, it is *warm* and *rarified*; but when it is drawn out of the Body, is grows *cold* and *thick*; and

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(*c*) Compare JOAN. ERNEST. *Tract. de Oleis Chym. deſtill. apud* HARTMANN. *Prax. Chymiatr. p. m.* 538.

and therefore we cannot exactly diſcover it's *Gravity*, with regard to it's *bulk*. But in various Regions both cold and hot, the Blood being *weighed* as ſoon as drawn out of the Body, has been found to be to *ſalt* Water as 26 to 25: but the Serum is to the *ſame* Water, as 300 to 253, therefore the Serum is *heavier* than the Blood by about *one ſixth* part; which indeed ſeems to be contrary to experience, ſeeing the Serum ſwims above the *Inſula*: but this proceeds from the parts compoſing the *Inſula coaleſcing* into a more ſolid and compact Maſs by the power of *cold*, joined to their *mutual Attraction*; and this appears from the *Inſula* and Serum together not occupying ſo much *ſpace*, as they did before their ſeparation. Thus therefore a *Levity* in the Blood, with reſpect to *ſalt Water* has not yet been diſcovered, for whenſoever it has been weighed, it has been found to exceed the weight of *ſalt Water* by about *one twenty ſixth* part; but if there is any ſuch thing, it may ariſe from all *aqueous*, *oily* and *ſpirituous* things, for they are *lighter* than *ſalt Water*. But the Blood grows heavier by the *Mineral* and conſolidated *Vegetable* particles: which is beſt ſeen in a *viſcid Scurvy*; for in that caſe the Blood is compacted and for the moſt part ſaline; but the Urine the *heavieſt* with reſpect to a Man in health: and this ariſes from an abundance of *muriatic Salt*, which in a due quantity is of great uſe, and altogether neceſſary to life; but if it exceeds in quantity, it produces the worſt effects: and therefore thoſe Bodies which are *heavier* than the Blood, as *fixed Salts*, are entirely excreted by Urine; thus *Marine Salt* comes out *unchanged* in the Urine; and it's uſe is to dilute the Blood. Moreover *heavy* Medicines becomes *poiſonous*, ſo far as they deſtroy the Veſſels and increaſe the Secretions too much.

CHAP. XI.

Of the ProjeEtile Motion.

1. BY the *projectile motion* is underſtood the *circulatory motion* of the Liquids thro' the Veſſels: and as very many diſeaſes, and life and health and old age depend upon it, it will be worth the while to ſee what *increaſes*, and what *diminiſhes* or *depraves* this *motion.*

2. IN the firſt place that *motion* is increaſed by the *motion* of the Body it's ſelf being *increaſed*, for thus it *increaſes* greatly when a Man *runs*; for at ſuch a time he has a *frequent pulſe*, *ſweat*, *thirſt*, and *panting*, and all the *ſymptoms* of a Fever; which ſoon diſappear, on the Man's being *at reſt*: but if he continues running beyond his ſtrength, then all theſe Symptoms will be more *vehement*, and a ſort of *inflammation* will ſieze the whole Body; and his Urine, if viewed by a Phyſician, will appear to be that of a Man in a *high Fever*: and if this exerciſe continues much longer, a real diſeaſe will ariſe. Therefore by the ſole *increaſe of the projectile motion*, without any *internal* change of the Fluids, a diſeaſe may ariſe. Thus alſo Diſeaſes often ariſe from a *diminution* of the ſame *motion*; and the cauſe of ſuch a *diminution* is generally *ſadneſs*: thus, for example, if a Man ſitting *chearful* at table receives the news of ſome great misfortune, being ſtruck with grief on a ſudden, or affrighted, he acquires a ſtagnation in his Liquids; whence a diſeaſe will immediately ariſe, unleſs it be prevented by drinking a large quantity of ſome *diluting* Liquid. In like manner we ſhall find that the *increaſe*

or *diminution* of the *projectile motion* of the Fluids is the cauſe of very many Diſeaſes.

3. The *primary* cauſe of this *projectile motion* is the Heart. If our Liquids were never to be ſtopped by the Canals thro' which they flow, or the continuity of the Canals was never to be interrupted, then being once put in *motion*, they would always continue to be moved: but there is a reſiſtance in the Canals, and their continuity is interrupted; for near the Heart the Liquids enter into the *Sinus Venoſus* and *Auriculæ*, where for ſome time the force and continuation of flowing *reſts*; but as no Body can *move* it's ſelf, of it's ſelf alone, it is neceſſary that our Liquids, ſhould receive a *new* motion from ſome *external cauſe*, that exerts it's power where they have loſt their *motion*; now this cauſe is the Heart, which is a very *ſolid* Muſcle, in it's figure reſembling a *ſcrew*, by the help of which, as we learn from Mechanics, a weak force may exceed an incredible reſiſtance: ſo that the Heart is the *ſole* and *ſufficient* cauſe of all *motion.*

4. Besides this *primary* cauſe, there is another alſo, namely, the *elaſticity* of the Veſſels, or that *force* by which their *ſides* being *diſtended* by the Liquor flowing in, *reſtore* themſelves, and that into their *former* ſtate: for the Fluid being driven with great *force* from the Heart into the Ateries, *diſtends* them immediately; and they being *elaſtic*, when the *force* of the Heart ceaſes, immediately reſtore themſelves, and with a greater *force*, the more they were *diſtended.*

5. The departure of the Blood out of the Heart, or it's *projectile motion* is not owing to an *inteſtine motion* of the Blood, as ſome have imagined, but to the *action* of the Heart it's ſelf. The Liquids, which being contained and *confined* in a narrow place, and thence by the *inteſtine motion* of

their parts, *burſt* thro' an aperture, and are thrown into a *projectile motion*, obtain their effect *three ways*; 1. If the parts are thrown into a ſufficiently violent *motion* by the force of *heat*: but there is no *heat ſufficient* to produce that motion in our Body; for tho' Blood when *drawn* out of the Body, be brought to the ſame degree of *heat* which it may have when *contained* in our Veſſels, yet the only conſequence of that will be it's *putrefaction*: Fiſhes moreover have a *cold* Blood, which nevertheleſs *circulates*; and if it is *heated*, they die. 2. A Liquid ſuppoſed to be in the before-mentioned circumſtances, may be thrown into a *projectile motion* by the *elaſtic force* of it's own parts; namely, if any elaſtic Liquid were to be condenſed in a Veſſel *cloſe* on all ſides, ſome part of it would get out immediately on the making of any *aperture*: but it cannot be ſo in the Blood; becauſe the *elaſticity* is compenſated by the weight of the Atmoſphere *encompaſſing* the Body, ſo that it can by no means *expand* it's ſelf, to produce the *projectile motion*: beſides the Blood *contained* in the Veſſels cannot *expand* it's ſelf by the ſame *power* of it's *elaſticity*, becauſe of the *preſſure* of the *incumbent* external Air; therefore as it is *elaſtic*, it exerts it's *force*, according to the nature of *elaſtic* Bodies, where there is the *leaſt* reſiſtance, that is, it *preſſes* towards the Heart, wherein is contained a portion of the ſame Fluid, which acts with *equal force*; and therefore no effect can follow. 3. The *projectile motion* of a Liquid may be procured by the force of Fermentation: but there is never obſerved any *Ebullition* of the Blood, which is called Fermentation, in the Heart.

6. BUT the circulation of the Blood in general is accelerated *three ways*; 1. By frequent ſtrokes of the Heart, 2. By an increaſe of it's ſtrength, 3. By an increaſe of the maſs of Blood, the ſtrokes

of the Heart remaining the ſame; becauſe then the *whole* maſs performs the *ſame* circulation in the *ſame* ſpace of time, that a *leſs* quantity ought: but the *velocity* depends on the *preſſure* of one particle on another.

7. But this circulation is *retarded*, 1. By a diminution of the force of the Heart, 2. By the Veſſels being lax and leſs elaſtic, 3. By an unfitneſs for motion in the Liquids themſelves.

8. Therefore what increaſe the *velocity* of the Heart are, 1. All that increaſe it's force; which is done (α) by giving it ſtrength, and (β) by making the Liquids at the ſame time fit for *motion*: but no cauſe increaſes the *velocity* of the Blood, unleſs it forces the Heart to *contract*; now this *contraction* is cauſed and augmented by whatſoever ſtrongly *affects* the *Nerves*; as *Aromatic Oils*, and *Metallic Bodies*, *Cauſtic Alkalines*, *Salts*, and alſo *Cryſtals*, *&c.* which promote the circulation, not by cauſing a Ferment in the Blood, but by ſtimulating the Veſſels and Nerves, and increaſing the *oſcillatory motions*. 2. Violent and heating *affections* of the Mind, as *anger*, *fury*, *&c.* 3. A *continual* exerciſe of the Muſcles; for by the *frequent* action of the Muſcles, the *motion* of the Blood in the Veſſels between the Muſcles is greatly promoted. 4. An *increaſe* of reſpiration, which if it be often repeated, greatly conduces to accelerate the *motion* of the Blood. The cauſes that *retard* the circulation are directly oppoſite to theſe.

CHAP. XII.

Of MEDICINES.

1. AS *various* Medicines are required, according to the nature and diſeaſes of the *various* parts; we muſt examine into their *names*, *claſſes*, *nature*, *powers* and *actions*: in treating of which *two* different orders may be obſerved; 1. By enumerating in an *alphabetical* order *each* ſimple, with it's *virtues*, *uſes*, *&c.* but this method is to be rejected as uſeleſs: 2. By enumerating together all thoſe Medicines, with which it is manifeſt from natural hiſtory that the *ſame* attributes and the *ſame* effects agree. This method was *firſt* uſed by GALEN, (and after him by many others, as ORIBASIUS, ÆGINETA, and in ſhort by all the *Botaniſts*) who reduced all Medicines to certain Claſſes; and ſo made *four* ſorts of Powers of all Medicines; 1. *Elementary* medical Powers, 2. *Material*, 3. *Singular* or *ſpecial*, 4. *Subſtantial unknown*, and to be known only by experience. But what he meant in the firſt place by *elementary* Powers or Virtues, will preſently appear, when we know his mind: for he ſays that, what *diſtinguiſhes* one body from another in the nature of things, is called a *Quality*; therefore there would be as many *Qualities*, as *different* Bodies; they are but four however according to GALEN, Moiſt, Dry, Hot, and Cold: wherefore he has reduced all Bodies to theſe four Claſſes. But as thoſe *Qualities* are ſeldom found *ſeparately* and *ſingly*, he has added therefore four combinations of them, called *Temperaments*, namely Hot and Moiſt, Hot and Dry, Cold and Moiſt, and Cold and Dry. Thoſe Bodies, which enjoyed but one of the four

ſimple Qualities, he called Elements; which alſo he thought to be four, namely Air, becauſe dry; Water, becauſe *moiſt*; Fire, becauſe hot; Earth, becauſe *cold*. Of theſe he thought that all Bodies were *compounded*; and that they acted according to thoſe *Qualities*; he affirmed the ſame of Medicines, and therefore divided their power into four Claſſes. Thoſe which were compoſed of theſe four, mixed in equal quantities, he called *elementary*, and our Body *elementated*; and aſſerted that diſeaſes aroſe from the *predomination* of ſome of theſe *Elements*. He would have four degrees alſo; according to which this or that *Element predominated*: thoſe Medicines which being applied to a Body in *health* produced no *alteration*, he ſaid were of the *firſt degree*; for example, Violets and Roſes were ſaid to be *cold* and *moiſt* in the *firſt degree*; but they may be hurtful in a *cold* diſeaſe. The *ſecond degree* is, when Medicines may *affect* or *change* a Body in *health*, but not *hurt* it. The *third degree* is, when the power is ſuch, as not to *deſtroy* a *healthy* Body, but to *injure* it and render it *morbid*: and theſe Medicines he thought were to be applied, when a diſeaſe, in the *ſame degree* ſiezes the Patient. The *fourth degree* is *deſtructive*; as in Euphorbium, and other Poiſons, which when applied to the Body, affect it in ſuch a manner, as to cauſe Death.

In the ſecond place, by material Powers GALEN meant thoſe, which depend on ſome *proportion* between themſelves and the matter: and hence he diſtinguiſhed *material* Powers from *elementary*, as being *proper* to the Body; and he called them *manifeſt*, becauſe they are *compound*, and *compounds* are more conſpicuous than *ſimples*; for matter is compounded of two *Elements* at leaſt; and therefore is more conſpicious than mere *Elements*: according to this Expoſition, an *emollient* herb is ſaid to be *re-*

laxing and *emollient* at the ſame time, by *material* powers; but to *heat* by an *elementary* power or heat.

In the third place, he made the *ſpecific* power to depend on the two preceeding, combined after various manners, and thoſe Medicines to be endued with *this* power, which are *proper* to any peculiar part, or are deſtined to any *peculiar* operation; ſuch as *Purges* which carry off any ſpecific Liquor, as Serum, Bile, the Menſes, *&c.* and thoſe which *cicatriſe*, and *generate Fleſh*, *&c.* all theſe he would have to act on account of their *ſpecific* virtues.

In the fourth place, by *ſubſtantial unknown*, he meant thoſe, which cannot be inveſtigated by any other method than by *experience*; ſuch is the *ſoporific* power of Opium which is not diſcovered by it's *humidity*, or *heat*, or *dryneſs*, or *cold*, but only by *experience*. It appears now from what has been ſaid, that GALEN was in an error, when he endeavoured to explain the *effects* of all Medicines by *qualities alone*; which not being able to do in Antidotes, Alexipharmics, Topics, *&c.* he called them *divine* and *unknown*: beſides he was miſtaken in admitting only four *qualities*; when many others may be enumerated.

2. A MEDICINE is a Body, which being applied to our *living* Body takes away it's *morbid* ſtate: now every Medicine may be conſidered, either 1. As it *acts* upon the Solids, or 2. As it acts upon the Liquids *only*, or 3. As it exerts it's *power* upon *both* together; and therefore all may be reduced to theſe three general Claſſes.

MOREOVER thoſe which *act* on the Solids, *act* either, 1. By reſolving and deſtroying their texture and coheſion, or 2. By obſtructing and dilating the Canals, and by changing the figure of their ſides.

THOSE which act on the Fluids *only*, act either 1. By *altering* their properties, or 2. By *bringing* them out of the Body: but almoſt all Medicines act as well upon the Solids, as upon the Fluids; for the Fluids can ſcarce be *altered*, without the Solids being in ſome degree *affected*, and on the contrary: but the *actions* of Medicines, ſo far as they *regard* the Fluids, may be conſidered, without conſidering the Fluids, ſo far as they *affect* the Solids, and on the contrary: juſt as the Mathematicians conſider *length only*, without any regard to *ſurface*, or *ſolidity*; tho' they do not exiſt ſeparately. But that what follows may be the more clearly underſtood, I ſhall premiſe ſome THEOREMS.

I. THE ſlighteſt *external motion* alone, which is merely *mechanical*, may produce every kind of *changes* in our Body, that any Medicine has ever yet produced: let us ſuppoſe any Man to be in perfect *health*, and let his Noſtrils be gently tickled with a *Feather*; he will not be able to hold himſelf ſtill one moment, without a *convulſive* motion of the Body, *bending*, *ſneezing*, *&c.* but if we conſider, by what a number of Muſcles, with what force, and ſtraining *ſneezing* is produced, we ſhall wonder at the *ſlightneſs* of the cauſe; for this action is performed by a violent *motion* of the Muſcles of the *Scapula*, *Abdomen*, *Diaphragm*, *Thorax*, *Lungs*, *&c.* beſides if the action *continues*, there will ariſe an *univerſal expulſion* of the Liquids, a *preſſing* out of Tears, Mucus, and *Saliva* of the Mouth, Palate, and *Aſpera Arteria*; alſo an *excretion* of Urine, Sweat, *&c.* and thus without any Moiſt, Dry, Hot, Cold, Sulphur, Salt, and *ſuch like*, a *motion* of all the Solids and Fluids in our Body may be cauſed only by the application of a *Feather* to the *inſide* of our Noſtrils: but if ſuch a *ſneezing continues* a long time, as it will by taking $\frac{1}{100}$ part of a grain of

Euphorbium up the Noſe, grievous *Convulſions*, laſting a long time, will ariſe, *Head-achs*, involuntary *excretions* of Urine and Stools, *Vomitings*, *febrile Heats*, and other dreadful *ſymptoms*, and at laſt Death it's ſelf will enſue.

II. If now *ſo great* a change can be made in our Body by a *ſlight* and *external motion*, what may not happen, if the Nerves are *affected* internally? and hence it appears that the *ſlighteſt* Bodies can make the *greateſt change* in our Body. But tho' there is no Body that can *act* on the Solids, without *affecting* the Fluids at the ſame time, and on the contrary; yet Medicines may be diſtinguiſhed, into thoſe which *immediately* or *primarily affect* the Solids, but the Fluids only *mediately* and *ſecondarily*, and the contrary.

III. It is manifeſt that all our Liquids may be *changed*, by this *mechanical motion*, there being nothing done to them *internally*; as appears from the caſe juſt now mentioned.

IV. The *motion* only of the Animal Spirits being *changed*, without any *impreſſion* from any Body either *external* or *internal*, communicated by means of contact, all the effects, which any Phyſician can aſcribe to a Medicine, may ariſe: for let us ſuppoſe a Man otherwiſe *healthy*, to be *ſubject* to an Irritation of the *Nerves* or the Hypochondriac Paſſion; in his beſt *health*, let an occaſion be given him of *anger*, *fear*, or *ſadneſs*, and there will immediately ariſe a very great *alteration* in his *condition*: for what before uſed to *perſpire* thro' the *pores* of the Skin to the weight of about *five pound* in four and twenty hours, now *changes* it's courſe, and makes way thro' the Kidneys; nay, and the *trajectory*, *ſecretory*, and *excretory* Veſſels are alſo *diſturbed*: now who knows any *Diuretic* that is capable of exerting ſuch powers? beſides the excreted

Liquor juſt now mentioned is not Urine, but mere Lymph, the *Salt*, *Spirit*, *Scent*, and *Colour* of Urine being left behind in the Body. In like manner we are ſometimes thrown into *Purgings* by *fear*; whence ariſes a vulgar reproach to *timorous* Perſons. By *anger* alſo a quantity of *Bile* is ſometimes thrown off. *Sweats* alſo often ariſe from *fear*. *Vomiting* is cauſed in ſome Men by the ſight of a *nauſeous* object, or by the telling of a *nauſeous* ſtory; for hence ariſe, firſt *eructations*, then a *nauſea*, *ſpitting*, *convulſion* of the Stomach, *vomiting*, and ſometimes an *evacuation* by ſtool and ſweat. Every kind alſo of *evacuation* may be excited *only* by an *unuſual motion* of the Body; thus the *firſt time* any one goes upon the Sea, whether his Stomach be full or empty, he firſt grows *pale* and *anxious*, then *nods*, grows *giddy*, and at laſt vomits. Thence it appears that our Machine is ſo formed, that tho' nothing is done to it by any ſort of Body, yet by the *mechanical motion* of the Spirits being *perverted*, it may be ſubject to all the *effects*, which are wont to be produced by Medicines.

V. This ſo wonderful motion may be excited in us, by the application of *inſenſible particles* of Bodies to our Machine; thus ſome, as ſoon as they enter a room, where there is a *Cat*, a *Mouſe*, or *Cheeſe*, tho' they are not in ſight, fall into *ſweats* and ſometimes *faint*, and ſome *drop down*, and *hyſterical* Women immediately fall into an *agony* by the ſmell of *muſk*.

VI. Medicines may be divided into ſuch *minute* parts, as to eſcape almoſt the power of imagination; *each* of which however will *retain* the the *powers* which before were *proper* to the whole maſs: of which I ſhall give *three* examples, taken from the *three* Kingdoms, the Mineral, Animal and Vegetable.

1. It is manifeſt from experiments often made by inquirers into Metals, that if *one grain* of gold be exactly mixed by *fuſion* with a *pound* of Silver, each grain of Silver will *partake* of the Gold; the ſame will alſo happen, if a thouſandth part of a *grain* of Gold be mixed with the ſaid *weight* of Silver: but the Gold, tho' reduced into ſuch *minute* parts, retains the *virtues* and *properties* that are *peculiar* to Gold; and it appears from hence, that thoſe *minute* parts may again be gathered into *one* Body truly *Gold*. This is alſo proved another way; for if *gr*. i. of Gold be *diſſolved* in ℥x. of Aqua Regia, there will not be a ſingle *drop* of the Liquor without a *particle* of Gold in it, as will be manifeſt by the taſte: and therefore as, in that caſe, there is no proportion between the Liquid and the Metal, it is neceſſary, that the Metal muſt be divided into moſt *ſubtile* parts; but in the mean time it remains *unchanged*, as appears by it's *precipitation*, and *reduction* into the form of Gold. But if Copper be taken inſtead of Gold, the thing becomes ſtill clearer; for the Copper will tinge the whole *menſtruum* with a *green* colour. From what has been ſaid it appears, why *metallic* Bodies being *diſſolved*, and *reduced* into the form of Liquids, produce ſuch laſting effects: namely, becauſe *every* particle preſerves it's own figure, remaining *rigid* and *immutable*; but it is not ſo in Vegetables.

2. But that we may know into what *minute* parts Bodies taken from the Animal Kingdom may be divided, I ſhall mention an experiment inſtituted by Boyle for this purpoſe: he unrolled the *bag* of a *Silk-worm*, and found it to be 300 yards long; and Lewenhoeck has diſcovered that it conſiſts of a *double thread*: it was therefore 600 yards long, and weighed but *two grains*: and ſo ſtrong as to ſuſtain a weight of *two grains*. But if

we add, that Mechanicians can divide an *inch* into I know not how many *millions* of parts, before it's *figure*, with regard to it's principal, is loſt, we may thence eaſily gather the great *diviſibility* of the parts of Animals: which all *odoriferous* Bodies prove, and eſpecially *Caſtor*; which being put into a pair of *ſcales* for *four days* loſt none of it's *weight*, and yet ſpread continual exhalations and a notable *ſcent* all the time, within the compaſs of about three *feet*, and being expoſed to freſh *Air*, gave that a *ſcent* alſo, in *two minutes*, without any ſenſible loſs of weight.

3. WITH regard to Vegetables, if you take *gr.* i. of *Extract of Saffron*, and put it into ℥x. of *Spirit of Wine*, it will tinge the whole Spirit, and every *drop* will have the *ſmell* and *taſte* of *Saffron*. It is manifeſt therefore from what has been already ſaid, that the parts of Medicines may be ſo far *comminuted*, as to eſcape our obſervation; and indeed tho' theſe parts are *tranſparent*, and eſcape our Senſes, yet they produce notable *effects* in our Body: I ſhall give an inſtance in the *glaſs of Antimony*, of which if ℈i be infuſed in ℔viii of *Wine*, and they be digeſted together, the *Wine* becomes ſo powerfully *emetic*, that ℥iv of it being *drank* will throw the Stomach into ſuch *convulſive* motions, as almoſt to invert it; when at the ſame time the *glaſs of Antimony*, which remains *undiſſolved* at the bottom of the Veſſel, ſeems to have *loſt* nothing at all: it is the ſame in the *crocus of Antimony*, &c. (a).

(a) It is manifeſt therefore, that there is a *ruling Spirit* in every Medicine; on which *alone* depends the whole *force* and *energy* of the Medicine: and this *Spirit* is in ſo *ſmall* a quantity with regard to it's *bulk*, that it exceeds all belief; for which it is worth while to conſult our AUTHOR's *Elementa Chemiæ, Tom II. page* 124, *and ſeq.* Beſides it may be proper to obſerve, that our celebrated AUTHOR ſpake about the *ruling Spirit*

VII. The particles of Medicines, as they are applied to *various* Nerves, produce *various* effects: I ſhall give the *turbith Mineral* for an example, which is made of *Oil of Vitriol* and *Mercury*, for if *half a grain* of it be put up the Noſtrils, it makes all the Secretions *violent*; if it be given internally, it will excite a *faintneſs* and *anguiſh*; but if it be taken in a greater quantity, as viii. *gr.* it will work by *ſtool*, *vomit*, and *ſweat*, and cauſe a very great irritation of the *Nerves:* to this purpoſe is a remarkable caſe related by Boyle, of a certain Colonel who was troubled with a *Cataract*, and was cured by *gr.* i. of this *Turbith*, given him in form of a *Sternutatory*; which firſt cauſed a *ſwelling* in his Head, *purging*, *ſweat*, *&c.* See his *Treatiſe of the uſefulneſs of experimental natural Philoſophy.* (*b*).

Spirit to his Auditors, when he dictated to them this courſe of lectures concerning the *Power of Medicines*, tho' it was omitted in the *former edition* of theſe lectures; and that Sendivogius, commonly known by the name of Cosmopolita, has obſerved this truth, aſſerting, "that in every Body there is a *centre* and "certain *place*, in which the *Seed* is, and where there is always a ſort of *point*, that is, about an *eight thouſand and two hundredth part* of the Body, be it ever ſo little, nay even "in *one* grain of Corn: and that cannot be any otherwiſe, *&c.*" See Cosmopolita *Novum Lumen Chymicum*, *Tract* 3. *of the true and firſt matter of Metals*, French edition, page 15.

(*b*) [As this caſe is not related by the noble Author here quoted, as from his own experience, and as it is not delivered by him without ſome cautions, it may not be improper to inſert his own words. "A Chymiſt of the *French King* told me, "that there is yet living a Perſon of quality, by name *M. de Vatteville*, well known by the command he had of a regiment of *Switzers* in *France*, who fell into a violent diſtemper "of his Eyes, which in ſpight of what Phyſicians and Chyrurgeons could do, did in a few Months ſo increaſe, that he loſt "the uſe of both his Eyes, and languiſhed long in a confirmed "blindneſs; which continued 'till he heard of a certain Emperic at *Amſterdam*, commonly known by the name of "*Adrian Glaſmaker*, (for indeed he was a Glaſier) who being "cry'd up for prodigious cures he had done with a certain

VIII. Various effects therefore follow, according to the *various* application of a Medicine, which we know only *a poſteriori* ; but if we may be allowed to conjecture, perhaps the following *conſiderations* will not be contemptible, 1. A *greater* or *leſs nakedneſs* of any Nerve helps to produce *greater* or *leſs*, and alſo *different* effects that are ſo violent: for the *coat* which lines the Noſtrils, is a *nervous expanſion*, and has hardly any coverings ; and every Nerve, when it is going to become *ſenſible*, turns into a *ſoft* and *mucous* ſubſtance ; which here happens in the higheſt degree. 2. The nearer the Nerves are to their *origin*, the more *ſenſible* they become ; and hence they are more eaſily irritated by

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“ Powder, this Colonel reſorted to him, and the Emperic hav-
“ ing diſcourſed with him, undertook his recovery, if he would
“ undergo the torment of the cure ; which the Colonel having
“ undertaken to do, the Chyrurgeon made him ſnuff up into each
“ Noſtril about a grain of a certain *Mercurial* powder, which
“ in a ſtrangely violent manner quickly wrought with him al-
“ moſt all imaginable ways, as by Vomit, Siege, Sweat, Urine,
“ Spitting, and Tears, within ten or twelve hours that this
“ Operation laſted, making his Head alſo to ſwell very much :
“ but within three or four days after this ſingle taking of the
“ Draſtic Medicine had done working, he began to recover
“ ſome degree of ſight, and within a fortnight attained to
“ ſuch a one, that he himſelf aſſured the relater, he never
“ was ſo ſharp-ſighted before his blindneſs. And the relater
“ aſſured me that he had taken pleaſure to obſerve, that this
“ Gentleman, who is his familiar acquaintance, would di-
“ ſcern objects farther and clearer than moſt other Men. The
“ preparation of it, which a Chymiſt did me the favour to tell
“ me by word of Mouth, as a thing himſelf had alſo made,
“ was in ſhort this: that the Remedy was made by precipi-
“ tating Quickſilver with good Oil of Vitriol, and ſo mak-
“ ing a *Turbith*, which is afterwards to be dulcified, by abſtra-
“ cting twenty or twenty-five times from it pure Spirit of
“ Wine, of which freſh muſt be taken at every abſtraction.
“ But I would not adviſe you to recommend ſo *furious* a
“ powder to any, that is not a very ſkilful Chymiſt, and
“ Phyſician too, 'till you know the exact preparation, and par-
“ ticular uſes of it.”]

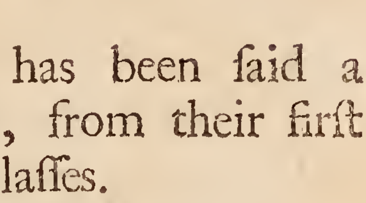
by *remoter* Bodies: thus for example, the Olfactory Nerves are ſtrongly irritated by the application of *Turbith*, as a *Sternutatory*; when the ſame being *elſewhere* applied to the Nerves is ſometimes ſcarce perceived by them. 3. The communication of one Nerve with others may *vary* the effects of a Medicine: for ſome Nerves, ariſing from a different *origin*, often meet together, and are tied in a *common* knot; but as the ſame meetings are not in all, the *ſame* Medicines act *differently* in *different* Men. 4. As the Nerve to which any Medicine is applied tends towards *Glands*, *Emiſſaries*, or *Emunctories*, the effect of the Medicine is *varied*.

CHAP. XIII.

Claſſes of Medicines.

ACCORDING to what has been ſaid a little before, all Medicines, from their firſt diviſion, are divided into three Claſſes.

I. THE firſt Claſs is of thoſe which act on the Solids: by Solids I underſtand theſe *laſt* parts of our Body explained CHAP IV. Now Medicines act on theſe, by *moving* them ſtrongly, without deſtroying their *coheſion*. For example, let A B be two *laſt* parts, cohering at C D, they may be *moved* without ſeparation or ſolution. Medicines of this Claſs are 1. *Stimulating*, 2. *Contracting*, that is ſuch as cauſe the Solids to have *leſs* length, and *greater* thickneſs; but ſo that their coheſion is not deſtroyed; and ſo *contracting* Medicines *thicken* Bodies, and *connect* them more firmly



firmly together. 3. *Relaxing*, which make the parts cohere more *laxly*, ſo as to become moveable, flexible, dilatable and thinner. 4. *Conſtipating*, which diminiſh the capacity of the Canals. And to theſe are to be referred (α) *Emplaſtics*, or all that ſtick to the Canals; (β) *Illinents*, which are more fluid than *Emplaſtics*; (γ) *Obſtruents*, which not only make the Canals narrower, but alſo fill them up. 5. *Specific Chirurgical* Medicines, as *Sarcotics*, or generaters of fleſh, *Cicatriſing* Medicines, and ſuch like. 6. *Solvents*, which may be divided into ſix Claſſes; namely (α) *Reddening*, which produce a ſlight inflammation; (β) *Veſicatories*, which by their action deſtroy the Lymphatic Veſſels, (γ) *Eſcharotics*, which not only deſtroy the *ſmalleſt* Veſſels, but even the Skin it's ſelf; (δ) *Corroding*, which conſume every thing to which they are applied; (ε) *Cauſtics*, which conſume the parts by *burning* them; (ζ) *Putrifying*, which turn all our parts into a putrid Fluid.

II. The ſecond Claſs contains Medicines which act upon the Fluids; either by *affecting* the *whole* maſs of the Fluid, or by *changing* the *bulk* or *figure* of ſome of it's particles: ſuch are, 1. *Attenuants*, which diminiſh the bulk of the particles: 2. *Condenſants* or *Incraſſants*, which increaſe the bulk of the particles: and theſe may be diſtinguiſhed according to their *manner of operating*, for *Condenſation* is performed by a Body preſſing the parts which were before at liberty, which therefore *coaleſce* and run into greater *moleculæ*; this is done by a *condenſing* cauſe, and an external *compreſſing* one, as by the external *preſſure* of *cold* Air; and thus Water is frozen in *Winter*: but *Incraſſation* is, when this combination of parts happens by a privation of the more *liquid* part diſſipated by *heat*. 3. *Cauſers* of *Acrimony*, namely, by *changing* the figure of the *moleculæ*. But thoſe are *acrid*, which communicate their motion by a few points; and thoſe *moſt acrid*, which by one only: now the nature of theſe was conſidered before; and it was obſerved, that all the particles of our Fluids have an *obtuſe figure*. To this place therefore belong thoſe which *putrify* our Liquids: and a *putrefaction* of the Liquids happens, when they are made *acrid* and too *ſwift* by a mutual *attrition* of their parts, and from ſweet are rendred *fœtid*; which *Fœtor* uſual proceeds from a *volatile Oil* made acrid by *Salt*: ſo that any *ſmoak* aſcending with *Salt* ſtrikes the Noſe with an *ungrateful* odour. 4. *Demulcents*, which are contrary to the foregoing, which are temperating alſo, by *obtunding* their Spicula. 5. *Immutants*, which *change* the Liquids in ſuch a manner, that we do not know the manner of their *change*: this is a *doubtful* kind, to which all are to be referred, of whoſe *manner of operating* we are ignorant. 6. *Diluents*; theſe regard the *whole* Maſs of the Liquid, whereas thoſe which went before act *ſpecially* on it's particles: and theſe are they, which being committed to our Fluids, remove their *coherent* parts from their *contact*, and interpoſe other particles that hinder their *coheſion*. 7. *Coagulaters*, which cauſe the fluid parts to *coaleſce*, either by exhaling the *diluting* part, or by adding a *glutinating* one, or by *compinging* the parts with each other. 8. *Movers*, which impreſs a *motion* on the particles. 9. *Siſtents*, which *diminiſh* their motion, and cauſe *reſt* to the whole Maſs.

III. The third Claſs is of thoſe which *act* on both Solids and Fluids together. And theſe may be divided into *five* Claſſes, in which is contained all that the Antients have written, reaſoning *à poſteriori*.

1. The firſt Claſs contains the preceeding Claſſes, ſo far as the Medicines contained under them *act* by combined actions, and either promote, or weaken and retard the Circulation of the Blood and the Secretions in general. In this Claſs alſo we place ſuch Medicines as provoke peculiar Secretions, as *Milk*, *Semen*, &c.

2. The ſecond Claſs contains thoſe which promote Excretions in any part of our Body. But as *various* Liquors are excreted in different places, there are alſo *various* Claſſes of thoſe which promote Excretions; namely, (1) *Movers of Tears*, (2) *Movers of Phlegm*, ſuch as draw out the Mucus of the Noſtrils: to which are referred *Sternutatories*, which properly draw the Serum out of the Noſtrils. (3) Such as draw forth the *Saliva*; and theſe are either *external*, as *Maſticatories*, or internals, as *Mercurials* and *Emetics*. (4) *Expectorants*, which promote the excretion of Phlegm from the Lungs. (5) *Purgatives*, which contain, (α) ſuch as *lubricate* the coats of the Inteſtines; (β) *Laxatives*, or ſuch as expel the contents of the Inteſtines, by relaxing their rigid Fibres; (γ) *Eccoprotics*, which draw out the *Fæces*, by lightly increaſing the motion of the Inteſtines; (δ) *Phlegmagogues*, which evacuate the pituitous Lymph; (ε) *Cholagogues*, which throw out the Bile; (ζ) *Melanogogues*, which expel the *atra Bilis*; (η) *Hydragogues*, which diſſolve the Blood into Serum, and move it more ſwiftly being diſſolved, ſo that it comes in greater plenty to the Inteſtinal Glands, and then throw it off: now theſe are the ſeven *Species* of *purging Medicines*. In this ſecond Claſs are contained moreover (6) *Emetics* or *Vomitories*, by the power of which the contents of the Stomach are thrown upwards thro' the Gullet and Mouth. (7) *Diuretics*, which promote Urine. (8) *Sudorifics*, which ſenſibly expel

the Liquids thro' the ſudoriferous Tubes of the Skin. (9) *Diaphoretics*, which promote Perſpiration. (10) *Uterines*, or Medicines appropriated to the *Uterus*, and theſe are divided again into three Claſſes. (α) *Emmenagogues*, which force the Menſes; (β) *Ariſtolochica*, which promote the *Lochia*; (γ) *Ecbolica*, which procure Abortion, and facilitate Delivery.

3. The third Claſs contains many which were confuſedly delivered by the Antients; as (1) *Attractives*, which derive the Liquids from one place to another. (2) *Repercutients*, which drive inwards the Liquid ſtopping in any external part. (3) *Coolers*, which take away preternatural heat. (4) *Heating* Medicines, which cauſe heat. (5) *Emollients*, which render the rigid parts more flexible, that is, relax the Solids. (6) *Suppuratives*, which diſſolve the *concreted* humour, and diſpoſe it for expulſion. (7) *Ripeners*, which render the *reſolved* Liquor equal and homogeneous, ſo that it may the more eaſily be brought out. (8) *Indurating*, which increaſe the ſtrength and rigidneſs of the Fibres, and render their lax parts more firm. (9) *Reſolvents*, which divide the coagulated parts of a Liquid, and make them fit for Circulation. (10) *Diſcutients*, which reſolve a Liquid that is extravaſated, or ſtagnates within a Veſſel, and diſpoſe it to flow, and ſtimulate the Solids to propel the Liquid: hence therefore every *diſcutient* is *reſolvent*. (11) *Aperients*, which attenuate a Liquid, and expel it when attenuated. (12) *Aſtringents*, which cauſe the ſides of the Veſſels, to approach nearer to each other. (13) *Styptics*, which cloſe the apertures of Veſſels. (14) *Expurgants*, which reſolve what is concreted in the Veſſels, and expel it. (15) *Detergents*, which cauſe indurated *Sordes* to melt, and draw them out, and take away dead Fibres alſo, without any ſenſe of

pain. (16) *Catherteria* or *Mundificatives*, which deterge with greater force, penetrate more to the inward parts, and even carry off ſound Fleſh. (17) *Erodents*, which are alſo *deterſive* and *mundificative*, but moſt powerful; for they hardly fail of carrying away living and ſound parts.

4. THE fourth Claſs in like manner contains *various* ſorts; namely *Topics*, which exert their *powers*, ſo far as they are applied to a *particular* place of the Body, and ſerve that *alone*. Now theſe are divided, according to the *different* parts of the Body, into the *following kinds*. (1) *Cephalics*, which are good for the diſeaſes of the Head: of which all the *painful* diſeaſes depend on an *imminent Rupture*, becauſe of the *tenſion* of the Membranes of the Brain, which it's ſelf alſo depends on *diſtenſion*, ariſing from too great a quantity of Blood, or ſome other humour, or an *obſtruction*: and therefore all that are *relaxing*, *temperating*, *refrigerating*, and *comminuting* are of ſervice on this occaſion, being therefore *cephalic*. (2) *Ophthalmics*, which cure the diſorders of the Eyes, and ſuch are *hot* and *cold*. (3) *Odontalgics*, which relieve the Tooth-ach; ſuch are *Cauſtics*, *Erodents*, *&c.* applied to the Nerve itſelf. (4) *Otalgics*, which eaſe the pains of the Ears, and relax the greatly *diſtended* Fibres; for no Membranes are more apt to be *diſtended* than the *Tympanum* or *Drum* of the Ear, and that which inveſts the *Meatus Auditorius*: on this occaſion it is uſual to apply *hot* things, as *warm Water* or *Milk*; or ſometimes *cold* things, which heal the diſorders of the Ears ariſing from their *bitter Oil* or Wax. (5) *Stomatics*, which regard the Inflammations of the Mouth, Gums, Palate and *Fauces*: and theſe indeed are to be ſubdued after the ſame manner with other Inflammations, but if there is a *Gangrene*, it is healed with *Oil of Tartar*; but in other reſpects

Alkalines are injurious, becauſe they corrode the Teeth. (6) *Arteriacs*, which immediately heal the *aſperity* of the Pulmonary Pipe, by ſoftening and ſmoothing it; and this is performed by *Oil of Almonds* and *Linctuſes* or *Lambatives*; which are not always of ſervice however, becauſe this *aſperity* often ariſes from an *obſtruction* of the internal Glands; in which caſe more benefit is received from the *ſteam of warm Water* taken into the Mouth, and various *emolient Decoctions*, of Barley, Liquorice, Mallow, and ſuch like. (7) *Thoracics* or *Pulmonics*, which obtund the *acrid* matter *thrown* upon the Lungs, and relax the paſſages: and theſe are of real ſervice in a *thinneſs* of the Humours; but do harm in a *pituitous* Peripneumony, which neither yields to *Sulphur* nor it's *Balſam*, but is in ſome ſort helped by *Spirit of Sulphur by the Bell.* (8) *Cardiacs*, or *Cordials*, which are either *cold* or *hot*: for when there is too great a heat and ebullition, *cold Acids*, of the *Juice of Citrons*, *Rheniſh Wine*, &c. are given to refreſh the Spirits; but in a *cold* ſtate, all *Aromatics*, which, making a ſudden repletion, ſupply the place of the parts that are flown off, and ſtimulate the parts. (9) *Stomachics*, which alſo are either *cold* or *hot*: for in the *hot* affections of the Stomach, *Citrons*, *Juice of Lemons*, *Vinegar*, and ſuch like are of ſervice; but in the *cold* affections, *hot* things. (10) *Splanchnics*, which open *obſtructions* of the Bowels: amongſt which the *chalybeate mineral Waters* obtain the firſt place; alſo all that are compoſed of *Iron* and *Mercury*; *Diſſolvents* alſo and *Aromatics*. (11) *Inteſtinals*, which are of two kin[illegible]; (α) *Carminatives*, which expel *Flatuſes*. Now *Flatuſes* are *elaſtic* parts of Air, intercepted between two extremities, that are contracted and ſhut up by a *Spaſm*; for there the Air *rarefies* and *expands* itſelf; and from this *diſtenſion* ariſes *pain*:

for the removing of which it is principally required, that the Air ſhould be freed from it's priſon ; leſt Inflammations, Mortifications, Gangrenes, Ruptures, &c. ſhould ariſe from too great a *diſtenſion* of the parts. Therefore every *Carminative acts* only by *opening* thoſe extremities, tho' the Antients thought that *Carminatives* diſſipated bubbles of Air, when in reality they only remove the *ſpaſmodic* action ; and thoſe terrible ſymptoms are not to be aſcribed to a *poiſonous Acrimony*, but only to *Diſtenſion* and *Spaſm:* hence perhaps there is no better *Carminative* than *Opium* it's ſelf, and thoſe Medicines which deſtroy the cauſes of *Spaſms*, by quieting the Animal Spirits, or ſheathing the *Acids* : for ſuppoſe a Man has taken *Arſenic*, in that caſe his Belly will ſwell, till it is ready to burſt ; but this ſwelling is immediately brought down, by taking ſome ſort of *Oil*, which may ſheath the *Acid*, that occaſions this *Spaſm*, for example, *Oil of Tartar per deliquium* diluted with a good quantity of *Water* : and thus when *ſpaſmodic Cholics* attack *hyſterical* Women, who are very ſubject to them ; and ſometimes have their *Anus* ſo cloſed by them, as to be incapable of admitting a Clyſter-pipe ; and ſometimes alſo have the Orifice of their Stomach cloſed up ; in ſuch a caſe, I ſay, the beſt remedy is *Opium*, *Caſtor*, or *Galbanum*, taken in *warm Water*. (β) *Anthelminthics* or *Vermifuges*, which kill the *Worms* that lie hid in the Stomach and Inteſtines: ſuch are the ſtronger *Purges* and *Emetics* ; alſo *rough Bodies*, as the *prickly heads of Eels* with Butter, taken faſting ; alſo *Shells* groſsly powdered, as *Oyſter-ſhells*, which vellicate, kill, and drive away the *Worms*. (12) *Hepatics*, which are nothing but *Aperients* : ſuch are all *Salts* not *acrid*, but *attenuating*, as *Sal Tartari*, *Sal Polychreſtus*, &c. (13) *Cyſtics*, which purge the Gall-bladder : ſuch are *Cathartics* and *Emetics*. (14) *Splenics*, which are appropriated to the Spleen, as all *Aperients* are. (15) *Meſenterics*, which are ſuited to the parts of the Meſentery; and are either *ſaline*, or *ſaponaceous*, or *aromatic*, or *ſtimulating*. (16) *Nephritics*, which either break the Stone, being therefore called *Lithontriptics*, or expel it: but whether there are any ſuch as the former, is juſtly doubted. (17) *Hyſterics*, which are appropriated to the *Uterus*; and are either *Stimulating*, or *Topics*, or *Antiſpaſmodics*. (18) *Arthritics* or *Neurotics*, which are ſaid *ſpecifically* to *act* upon the Nerves, and on the Membranes of the Bones and Ligaments of the Joints. (19) *Anodynes*, which take away pain, and contain *Paregorics*, *Hypnotics*, and *Narcotics*: of each of which I ſhall ſpeak in it's proper place.

5. THE fifth Claſs contains *Antidotes*, or *Alexipharmics*, which are ſaid ſpecifically to reſiſt Poiſon: now as Poiſons *act* in *three* different manners, namely, 1. By bringing a *Spaſm* upon the Solids, 2. By attenuating the Liquids, or too much coagulating them. 3. By burſting the Veſſels, and cauſing the Liquids to ſtagnate; therefore *Antidotes* are of *three* ſorts alſo; thoſe which act on the Solids, or on the Fluids, or on both together. But moſt Poiſons *act* by the power of their *Acrimony*; for if ℥ii of *Vitriol* be given to a Dog, an *intenſe heat*, *Eroſion* and *Spaſm* are immediately excited in his Stomach; and theſe ſymptoms are removed by *Antidotes* deſtroying *Acrimony*: ſuch are *Water*, *Oil*, or any *gelatinous* Body, *&c.* for there are no *Antidotes*, that deſtroy Poiſons *ſpecifically*, or that *act* any other way than *mechanically*.

PART

PART I.

OF MEDICINES THAT OPERATE ON THE *SOLIDS*.

CHAP. I.

Of Stimulating Medicines.

1. THUS far I have treated of the *various* Claſſes of Medicines, now I come to a more particular Hiſtory of each *title*: and firſt I muſt treat of thoſe which *act* upon the Solids; amongſt which the *Stimulating* hold the firſt place. A *Stimulating* Medicine is *that, which increaſes the oſcillatory Motions of an elaſtic Fibre.* To increaſe the

oſcillation of a *Fibre* it is required, that the increaſe of *motion* ſhould be given to the *Fibre* at the very *point*, whence the increaſe of *oſcillation* begins: now the cauſe of the increaſe of *motion* may be *twofold*; 1. A free *particle* not fixed to the Veſſel, *ruſhing* by it's own *impetus* on that *point*, for it drives the *point* beyond it's natural *ſituation*; but as ſoon as the impulſe of the *particle* ceaſes, the *Fibre* immediately *contracts* it's ſelf, that the *point*, which was *driven* out of it's place, may be again reſtored; and indeed the farther this *point* was removed from it's *ſituation*, the more the *Fibre contracts* it's ſelf: but the cauſes of ſuch an *effect* do not endure long, but ſoon diſappear. 2. The other cauſe, whoſe *effects* are more durable, may be a *particle fixed* to the ſides of a Veſſel, either *internally* by the contained Fluid, or *externally* by external *cauſes*: but how the *particles fixed to the Fibres ſtimulate them*, was explained, when I treated of *Acrids*.

2. THE Conditions required to conſtitute a *Stimulating* Medicine are, 1. That it be *fine* enough to get into the ſmalleſt Canals; and fix it's ſelf in their ſmalleſt *Pores*. 2. That it have a ſufficient *Acrimony* in it, to make it's ſelf an *aperture* in the ſides of the Canals, into which it may inſinuate it's ſelf. 3. That this *fine* and *acrid* Body be long enough to *appear* beyond the ſurface, when it is fixed, for otherwiſe it becomes a *nutritive* particle. Hence therefore we may gather, that every *Stimulating* particle is *acrid*; but yet it does not follow, that all that are *minute* and *acrid* are *Stimulating*; becauſe they may be ſo *ſmall* as to have no part of them appear above the *plane*, to which they are fixed. 4. That it be ſo *tenacious*, as to remain a long time in the place where it is fixed.

3. THE efficient cauſes of *Stimulation* are, 1. All cauſes of Wounds: for to *wound* is *to make a ſolution of continuity by ſome hard and ſharp thing*, that is, which applies the *momentum* of it's motion to a *few* points. Hence, 2. *Nettles*, and other *herbs* that are called *ſtinging*, produce a *Stimulation.* 3. All kinds of *Salts.* 4. All *Oils:* which may ſtimulate two ways; (α) ſo far as they fix themſelves into the *Orifices* of the Pores, and obſtruct them; whence the *impetus* of the Liquids is made on the extreme *points* of the Veſſels: thus *Olive Oil* rubbed upon the Body, cauſes to ſwell and redden; nay and ſometimes brings on a Fever, by hindring the Perſpiration: (β) ſo far as they are *acrid*, either by nature or art. 5. *Soaps* excite *Stimulation*, whether they are *artificial*, or *native:* as all Juices of Vegetables, ſo far as they contain a mixture of *Oil* and *Salt.* 6. All *Spirits.* 7. All *ſharp* Earths. 8. Any *Heat* frequently applied: under which head may be comprehended *Sulphurs*, and *metallic Salts*; for every *Metal*, how *mild* and *gentle* ſoever it may be in it's own nature, as we find in Gold and Silver undiſſolved, which are not in any degree hurtful, yet if they be diſſolved in *Salts*, or *ſtrong Waters*, become *cauſtic* and highly *ſtimulating.* 9. All external *Motions.* 10. Vehement *Cold*, which firſt of all *acts* indeed by giving a ſenſation of *cold*, but afterwards excites a violent *heat:* and this we ſee principally in *Fevers*, which commonly begin, with *cold*, *ſhivering*, *trembling*, &c. but theſe *Symptoms* are immediately ſucceeded by a great *heat.*

CHAP. II.

Of Contracting Medicines.

1. CONTRACTING *Medicines are thoſe which draw two diſtant points of an elaſtic Fibre into a nearer contact, and more firm coheſion.* Which that we may more eaſily conceive, let us ſuppoſe that A B in Fig. 1. is a *laſt ſmalleſt* *Solid*; and that E F, which is alſo a *Solid* of the ſame nature, adheres at C D; in ſuch a manner that theſe *two Solids* are *directly* oppoſite: this being ſuppoſed. I ſay they cannot be contracted; for the particle A B being ſolid and compact, cannot *enter* the particle E F being alſo ſolid and compact, to which it is connected; and therefore that it does not make the line A E more *ſhort*, that is, they cannot *contract* themſelves. But if we ſuppoſe, in Fig. 2. that the particle A B adheres to another C D, at the points between E F; this being ſuppoſed, we may eaſily conceive, that the particle may change it's ſituation, ſo as from A B to become E H; whence it comes to paſs that it now adheres to the particle C D by the points between E G: and thus the *length* which thoſe *two* particles had, becomes leſs, that is, there is a *contraction* of the particles.

Fig 1.

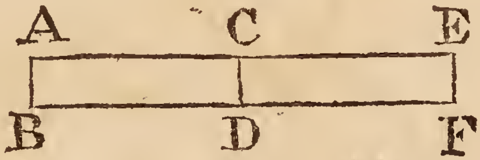
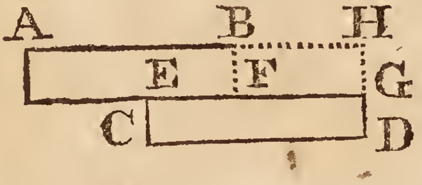


Fig. 2



particles. Whence it follows that our *leaſt Solids* cannot be contracted *by themſelves*, or *ſingly*; and conſequently that *contraction* is made only in reſpect of two or more *Solids of the ſame kind*, placed near each other.

2. Now the cauſes that promote *contraction* may be reduced to theſe four THEOREMS.

THEOREM I. Whatſoever diſſolves the *continuity* of any Fibre, promotes it's natural *contraction*; as was before demonſtrated; thus therefore our Arteries, Veins and Fibres being *wounded* and *cut contract* themſelves; hence alſo *Fire*, *Corroſives*, and *Vulnerants* are cauſes of *contraction*.

COROLL. Therefore moſt *contracting* Medicines act by *wounding* and *hurting*. By *hurting*, I mean in this place the *cutting* of the *ſmalleſt* Veſſels by any force: for our Body conſiſts of infinite *ſmalleſt* Veſſels; and theſe Veſſels do not run according to the length of the greater Veſſels, but are *compounded* between themſelves, and *twiſted* like *ropes*; of which you may ſee more in CHAP. V. ſo that a *great* Veſſel can hardly be hurt, without ſome of the *ſmalleſt* being torn to pieces; as the Arteries and Veins *contract* themſelves when *cut*, ſo alſo do thoſe *ſmalleſt* Veſſels: therefore *hurting* is the cauſe of *contraction* of the Veſſels; and Medicines which *hurt* theſe Veſſels, produce *contraction*; and ſuch are all kinds of *Acrids*. But the effect of the *contraction* of the Veſſels thus procured, is the *extravaſation* of the Liquids.

THEOREM II. *Contraction* is promoted by all thoſe, which by their ſtrong *endeavour* ſo dilate the Canals, that their *longitudinal* diameter becomes leſs, and their *latitudinal* greater: and theſe are of *two* ſorts, namely *repleting* and *ſtimulating*; and this is to be underſtood of excavated Fibres; hence alſo the lips of *wounds* become dry and *chapped*.

THEOREM III. *Contraction* is promoted by whatſoever takes away the cauſes of the *diſtenſion* of the Veſſels: and this is done by any *depletions*; as we plainly ſee in thoſe which act upon the *nervous Syſtem*, producing a *Salivation*, and thence a *Maraſmus*; for the Veſſels being too much emptied, *contract* themſelves, which makes the Body grow *lean*: the ſame is done alſo by all *hot* things, which are wont to diſſipate the *moſt liquid* parts.

THEOREM IV. *Contraction* is cauſed by the *inſinuation* of ſmall particles between the ſurfaces of the *ſmalleſt Stamina*; for thus if any Liquid *inſinuates* it's ſelf between two contiguous *Fibrillæ*, then they are contracted in proportion to the quantity of the inſinuated Liquid; for as this *inſerted* Liquor moves theſe *Fibrillæ* from each other, and therefore changes them from *right* to *curve* lines, it muſt neceſſarily *ſhorten* the whole length of the Fibre. Hence therefore ariſe wonderful effects; for *dry cords* being put into Water *contract* and grow *tight*, as the ſtrings of muſical Inſtruments; and ſo our Nerves alſo, and the Heart it's ſelf, which is very much *contracted* and grows *ſolid* in *Spirit of Wine*: now ſuch a *Contraction* is made by *Spirit of Wine* and *Oil of Turpentine*, which, when they have inſinuated themſelves, *remain* there, and grow *ſolid*; whence ſo many different ſymptoms follow from the abuſe of them: and from thence it is manifeſt how dangerous all *Contracters* are in the *ſmalleſt* Veſſels, becauſe they are *concreted* with them.

COR. I. Hence the *ſolidity* of any Fibre, may be increaſed; for the *inſinuating* particle applies it's ſelf to the ſides, and there *concreting* or uniting with it, gives a greater *ſolidity* to the Fibre.

COR. II. Therefore, the reſt being equal, the *Contraction* of the Fibres increaſes their power on the Fluids contained within the Canals.

COR. III. Therefore the *ſtrength* of the Body is increaſed by the *contraction* of the Fibres; hence all Men whoſe Fibres are thus contracted, have alſo greater *ſtrength.*

CHAP. III.

Of Relaxing Medicines.

1. BY *Relaxation* is meant, *ſuch a change in the Solids, as may make them longer than they were before, without any Rupture*; thus *Flexibility* and *Dilatation* are comprehended in this *definition*: ſince there can be no *flexure*, no *dilatation*, unleſs the Body be in ſome meaſure *prolonged.*

2. NOW this *prolongation* may be conſidered, either with regard to all the *ſmalleſt Fibrillæ*, or with regard to the Veſſels compoſed of thoſe *Fibrillæ*: moreover this *prolongation* cannot be conceived in the *ſmalleſt Fibrillæ*; for that the *ſmalleſt Fibrillæ* be ſet at a greater diſtance from each other, it is neceſſary that ſome *lubricating* particles muſt *inſinuate* themſelves between thoſe parts; but this cannot happen in theſe that are the *very ſmalleſt*, without a *ſolution of continuity.*

3. A MEDICAL therefore and proper *Relaxation* obtains only in the *laſt* of our Canals, which are compoſed of thoſe *Fibrillæ*; which, if they become *rigid*, and are deprived of their Liquids, ſo that their ſides *cohere*, loſe their *laxity*, which cannot be reſtored by any art, unleſs by ſupplying the *loſt* Liquids, by which they are *lubricated*, and rendered more fit for the motion of *flexion.*

4. Wherefore *Relaxing* Medicines are thoſe, which by entring the Canals, remove their ſides from each other, and render them ſoft by *lubricating* them: ſuch are, 1. *Warm Water*, either taken *inwardly*, or applied *outwardly*, as in *Baths*, *Fomentations*, *&c.* 2. All *Vegetable Oils* preſſed from mild, not acrid ripe ſeeds; as *Oil of ſweet Almonds*, *Olives*, *Linſeed*, *&c.* 3. Of the Animal Kingdom, the *Marrow* of Bones, which is moſt ſubtile, as having been derived thro' exceeding ſmall paſſages into the Cavities of the Bones; alſo *Sewet* and *Fat*, eſpecially that of the Cawl. 4. *Glutinous farinaceous Decoctions* in the form of an Emulſion; ſuch are uſually made of *Barley*, *Linſeed*, and other ſeeds, that yield *Oil* when they are preſſed; and of *oily*, lacteſſent herbs, that are not acrid; alſo of thoſe herbs that are called emollient. 5. All *ſaponaceous* Bodies, eſpecially the *Bile* of Animals, which is greatly emollient.

Cor. Hence that Problem is ſolved, why *Water* firſt *relaxes*, and then *ſtiffens*; as a *Hide* by being ſteeped in *Water* becomes very *ſoft* and *flexible*, but when dried again, becomes more *hard* and more *inflexible* than before: for when the *Water* firſt penetrates it, it has the nature of a *Fluid*, and therefore makes the parts *ſoft* by moiſtening them; but the *moſt ſubtile* part of it being *expelled* by the power of *heat*, what remains approaches to the nature of a *Solid*, and *unites* with the Fibres, and increaſes their firmneſs. Moreover the effects of *Relaxing* Medicines are two; 1. A Dilatation of the ſmalleſt Canals; 2. A more free Circulation of the humours, thence proceeding.

CHAP. IV.

Of Conſtipating Medicines.

1. *CONSTIPATING Medicines are thoſe which ſo obſtruct the out-lets of the Veſſels, as to intercept their vital Flux*; and therefore every *Conſtipater* acts, either ſo far as it adheres externally to a Canal, and compreſſes it; or ſo far as it ſticks *internally* to the ſides of the Canals, and ſtuffs them up: but whether any Medicine *conſtipates* in the latter ſenſe, we have reaſon to doubt; and that for theſe reaſons. 1. Becauſe the Lacteal Veſſels are ſo ſmall, that it does not ſeem poſſible for any thing to enter by them, that is able to create the *obſtruction* juſt mentioned in the other Veſſels. 2. If any ſuch *Obſtruent* did enter the Lacteals, it would fall firſt upon the Lungs, and there it's effects would be perceived; becauſe from it's entrance into the Lacteal Veſſels, to the very entrance into the Lungs, it is continually moved from a *narrower* into a *wider* Canal, as is manifeſt from *Anatomy*; but as ſoon as it is carried into the Pulmonary Artery, it begins to be moved from a *wider* into a *narrower* ſpace; and at laſt is carried into the moſt *ſtrait* Veſſels of the Lungs, in which, as they are the leaſt of the whole Body, it will either beget an obſtruction or no where. 3. The Blood is very much *broken* and *divided* in the Lungs, by the *compreſſing* force of the external Air, and is therefore rendered leſs capable of producing ſuch an *obſtruction.* Beſides it muſt be obſerved, that it is the nature of our Blood to *concrete* as ſoon as it is *at reſt*; but it is never *at reſt*, unleſs the motion of the Heart and Arteries is *diminiſhed:* and therefore

thoſe may be called *internal Obſtruents*, which *weaken* the *force* of the Heart and Arteries; which is generally perceived *equally* thro' the whole Body, but firſt in the Lungs. Thus therefore there is an *obſtruction* cauſed in a particular part, when for ſome cauſe, the Liquid is at reſt in that part; and thus ſuch *Obſtruents act* only by *coagulating* our humours.

2. *CONSTIPATING* Medicines are of *two ſorts*; *Illinents* and *Emplaſtics*. The *Illinents* are, 1. All *expreſſed Oils*, applied either externally or internally; for as they do not mix with *Water*, they hinder it's *flowing* thro' the Canals, as appears in *oiled Paper*. 2. *Mucilaginous farinaceous ſeeds*, as thoſe of *Poppy*, *Lettuce*, &c. boiled with *Water* to a Gelly; alſo the *four Colds ſeeds*. 3. *Compound Oils* of Vegetables and *Oil* boiled together. 4. *Oils diſtilled* from Vegetables. 5. All *native liquid Balſams* whatſoever.

EMPLASTICS are ſuch as *ſtop the Pores externally, like Glue*: and theſe have *two* effects; for, 1. They ſmear and ſtop up ſeveral Veſſels together; 2. They cauſe the Liquid to ſtagnate, and putrify. But the Claſſes of *Emplaſtics* are *five*. 1. All *Meals* conſiſting of Oil and Earth, reduced into a *Paſte* with a ſmall quantity of Water. 2. Every tenacious and agglutinant *Liquor*, that flows from Vegetables: now Plants afford *three* ſorts of Liquid of this kind; (α) that which may be *diſſolved* only in *Spirit of Wine*, and is called *Oil*; (β) that which is thicker, and *diſſolves* in *Water*, and is called *Balſam*, conſiſting of *Oil* and *Mucilage*; (γ) that which is compoſed of the former *two*, combined with Earth, and is called *Gum*; and this, if it becomes more ſolid, by the flying away of the finer part, is called *Roſin*. 3. All *Reſinous* Bodies. 4. All *Glues*, or *Decoctions* inſpiſſated by long boiling, made of the *ſolid* parts of Animals;

Animals, ; as *Icthyocolla* of Fiſhes, which is the beſt glue,: for the Author of nature, that Fiſhes might not continually be injured by the *Salt Water* with which they are ſurrounded, has placed innumerable *Glands* in their Skin ; which ſeparate an *Oil* ; whence the *Skin* of Fiſhes is very *balſamic*, and the *glue*, called *Icthyocolla*, *Iſinglaſs* or *Fiſh-glue* is made by boiling it to a gelly. 5. Compoſitions of theſe four, as *Cataplaſms*, *&c.*

3. But the effects of all *Illinent*, *Obſtruent*, and *Conſtipating* Medicines are ; 1. The hindering the paſſage of the Liquids, ſo as to make them *ſtagnate* in the Veſſels : for thus we are wont to preſerve *dead Bodies* by ſmearing them with any thing *unctuous* to hinder the entrance of Fluids : 2. The producing all thoſe things, which are wont to be produced by the *power of life* on any obſtructed Veſſel. For the *ſtagnating* Liquids are by the *power of life* preſſed from behind, altered, and increaſed in quantity ; whence ariſe *tumours*, which, if they are about Arterial Veſſels, become *inflammations* : if the tumour is about the Lymphatic Veſſels, it becomes a *white veſicular tumour*, or *œdema* : if about the *ſmalleſt* of all the Veſſels, a *flatulent tumour* ; as is uſual in the Gout, from the application of a Plaſter ; for thereby the paſſage of the Liquid is obſtructed, and therefore that part appears as it were diſtended with *flatuſes*. Moreover if the *obſtruction* and *inflammation* remain, and the *power of life* is not loſt, there ariſes an *Apoſteme* : if the *power of life* is much, and the *obſtruction* great, there ariſes a *Gangrene* : if all the *Liquid* is ſqueezed out, and the *thick* matter unites, there is produced a *Schirrus* : if that matter is moved, it becomes a *Cancer* : if a great quantity of Veſſels are deſtroyed by the *vital power* and an obſtinate obſtruction, there ariſes a *Sphacelus* or *mortification of the part.*

But if theſe *Illinents* and Obſtruents are applied to a *Carcaſs*, in which there is no *power of life*, they will have no other effect, than the preſerving of it from *corruption*.

CHAP. V.

Of Specific Chirurgical Medicines.

1. SPECIFIC *Chirurgical* Medicines are diſtinguiſhed into *Sarcotics*, or *Generaters of the Fleſh*; *Cicatriſers*, and *Generaters of Callus*; none of which act on a *Carcaſs*, but ſuppoſe a *vital flux* of the Liquid. *Sarcotics* are thoſe, which take away that which hindered the concretion and exſiccation of the Veſſels. *Generaters of Callus* are thoſe which take away the impediment of nutrition or accretion in the *ſmalleſt* bony or cartilagineous Veſſels.

2. BUT now that theſe Medicines may have their *effect*, there are ſome *conditions* required in our Fluids, and ſome in the Solids. In the Fluids it is required, 1. That they be mild or ſmooth, 2. That they be moveable thro' the ſmalleſt Veſſels, 3. That they be ſomething *glutinous*: for the *actions* of theſe Medicines are in the *ſmalleſt* and *moſt tender* Veſſels, which ſcarce differ from a Fluid; and therefore, the Fluids which paſs thro' theſe, ought to be void of all *Acrimony*, that they may not deſtroy the Veſſels; they ought to be ſuch alſo, as to *flow* eaſily thro' them; but not ſo *thin*, as to *flow quite out*, but of ſuch a conſiſtence, as to adhere to the Veſſels. But it is required in the Solids or Veſſels, 1. That they be *fit* to receive the Fluid,

2. That they be *flexible* and *dilatable*, ſo that ſometimes they may be eaſily *diſtended.*

3. These being ſuppoſed, the following muſt conſequently be the effects of theſe Medicines, 1. The disjoined Canals are united after the manner of an *Anaſtomôſis.* 2. The ends of the Canals are only ſo far *diſtended* by the *impetus* of the Liquid, as to be open only to Inſenſible Tranſpiration, or ſo far as to emit Sweat alſo: and this *laſt* is the beſt method of healing without a *cicatrix*; but it ſeldom is done, becauſe a *wound* is more quickly and eaſily conſolidated after the common manner; but then that part is not fit for Perſpiration. 3. There is an *accretion* and *withering* of the Veſſels, when their reſiſtance is ſuch, that the Liquids cannot enter; whence is formed a *cicatrix*, a *ſtagnation of the nutritious juice* in the laſt Veſſels, and a *concretion* and *agglutination* of it: for indeed every Liquid *ſtagnating* in it's Veſſel *concretes* with it; whence the part is covered with a *cicatrix*, and exceeds the other parts in *ſolidity*, *hardneſs*, *inſenſibility*, *whiteneſs*, and alſo a more difficult and ſpare Perſpirability. Hence becauſe of the preſſure of the Atmoſphere, ſometimes *pains* are felt in thoſe parts which were *wounded*: to avoid which, in the cure of wounds, the Veſſels ought to be preſerved ſo ſoft, as to be capable of *diſtenſion*; but moſt Surgeons by haſtening the cure ſo increaſe the *ſtrength* of the Veſſels, that their *reſiſtance* is greater than the *preſſure* of the Liquids, which therefore cannot enter; and ſo the Veſſels are *preſſed* together and there is formed a *Callus.*

4. From what has been ſaid it appears therefore that the Medicines of which I am now ſpeaking muſt exert their *powers* on the Fluids as well as on the Solids; and therefore are either *external* or *internal.* The *internal* are thoſe which afford a *mild Chyle*, which does not abound with any Salts, acrid

aromatic Oil, or terreſtrial Acrids; and which alſo yield a *thin Chyle*, but yet a little *viſcid*; for it muſt not be ſo thin as to cauſe a *Fluidity* in the wound: ſuch are 1. *Decoctions of Fleſh* and *Broths*. 2. *Decoctions of ſoft meals*, as *Barley*, *Oats*, *Wheat*, *Rice*. 3. All emulſions made of the ſame. 4. Such things as take away the *predominating Acrid*. Now *Acrids* are either *Alkalines* or *Acids*, or *Oils* or *Earths*, or ſuch as are combined of theſe *four*. But there are proper Medicines to temperate every ſort of *Acid*: for every *Acid* may be ſubdued by being ſheathed with *Oil* or diluted with *Water*, or blunted with *Mucilages*, or deſtroyed by *oppoſite Salts*, that is, *alkaline* Salts. But *Alkalines* are ſubdued by *Water*, *Oil*, *Mucilage* and *Acids*. *Acrid Oils* are compoſed either of *aromatic* or *alliated Oils*, or of *expreſſed Oils* which are grown *rancid*: and therefore are not eaſily taken away, becauſe the *Oils* adhere very pertinaciouſly, and do not eaſily yield to *diluting Water*, unleſs ſome *acid Salt* and a little *Mucilage* be added to it. *Terreſtrial Acrids* are hard and cutting Bodies, as *powdered Glaſs*, *cryſtals*, *Metals*, *Semi-metals*, and all *ſolid* Bodies ſo far comminuted, as to be able to enter into the Canals, and penetrate their ſides: but theſe cannot be maſtered, or got out, if they are deeply ſtuck into the ſides of the Canals; and the only attempt we can make to remove them, is relaxing the Veſſels with a great deal of *Oil* and *Water*. 5. Such as attenuate what is *thick*; for if the *matter* is too thick, the *wound* cannot be conſolidated: the beſt Medicine for this, is *fair Water warm*, to which may be added *fixed alkaline Salts*; for the *volatile* fly away too ſoon, and if they are taken in great quantity, ſtimulate too much. 6. Such as give an *equable motion* to the Liquids: of which kind are thoſe which keep the Liquids *equally lax*; as *Water* moderately warm. Now theſe are the *internal* Medicines which are required to the cure of *wounds.*

The *Externals* are thoſe, by whoſe help the *balance* is preſerved between the *reſiſtance* of the Veſſels and the *power* of the Liquids flowing in; ſo that the Veſſels *reſiſt* neither more nor leſs than they ought: but if the Veſſels are ſo diſpoſed, as to remain *in equilibrio* with their Liquids, then the *wound* will be cured without any *cicatrix.* Hither alſo conduce, 1. What *relax* the Veſſels; and amongſt theſe the beſt is *warm Water.* 2. What reſiſt *putrefaction*; as all *ſpirituous* Liquors, which are ſaid to cleanſe; alſo all *Salts*, except the *alkaline*; all *Oils* and *Balſams*, as *Turpentine*, *Balſam* of *Capivi*, of *Peru*, *&c.* and then all *Tinctures* made with *Spirit of Wine* and *Balſams*, as *Wormwood*, *Scordium*, and all other *reſinous* and *oily* Bodies; alſo *natural Balſams*, and *Ointments* and *Balſams* prepared with *Aromatics*; for all *Spices* contain a *Balſam*, which proceeds from their *Oil*, and may be extracted with *Spirit of Wine*; laſtly all *cerates*, *oily*, but mild *Unguents*, and *Plaſters*; of which one may be ſufficient, if made with *Wax*, *Turpentine*, and *Oil.* 3. Thoſe which *dry* the too *moiſt* Veſſels: for if the Fleſh is too *luxuriant*, *excreſcent*, and *fungous*, then it plainly indicates that the Veſſels are too much diſtended and dilated: and therefore exſiccation, or *eating the proud Fleſh away*, as the Surgeons call it, is required, Now *Exſiccants* are, the *Bones of Fiſhes calcined* in a ſlow Fire, and *powdered*; as the *mandibles of a Pike*, which abſorb the *acrid acid*, but if too long applied, *exſiccate*, and form a *cicatrix*: alſo all *ſtones of Fiſhes*, as *Crab*'s *Eyes*, *Pearls*, *&c.* *Colophony* alſo, which is made of *Turpentine* boiled in *Water*, and dried 'till it can be powdered, is of the greateſt ſervice; and is the laſt remedy in *drying up Fiſtulas*: alſo all *Earths*, as *Chalks*, *Boles*, *red Ocre*, *Oſteocolla*, *&c.* and laſtly *Earths* of Metals, as *calx of Vitriol*, well edulcorated, *Blood-ſtone*, *Saffron of Iron*, both the *aperient* and *aſtringent*, *Ceruſe*, *red Lead*, *calx of Tin*, which abſorb all Liquids. 4. Thoſe which by *contracting* the Veſſels, give them *ſolidity* and *ſtrength*; ſuch are *Alcohol of Wine*, *Oil of Turpentine*, almoſt boiling hot, *&c.*

CHAP. VI.

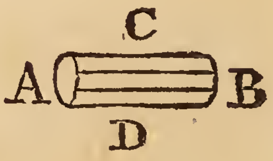
Of Solvents, or Cauſers of Pain.

1. PA[illegible] *is an uneaſy ſenſation, which accompanies the diſtenſion of a nervous Fibre*: for there can be no *tenſion* in any *nervous* part of our Body, without cauſing *pain*, tho' there be no *acrid* or *corroſive* there; as is plain from the *tortures* of an *executioner*. But if any part is bound *tight*, is too much preſſed, bruiſed, corroded, or cut, or deſtroyed by *Fire*, then all *Senſe of pain* is loſt in it: for if you cut the *Nerve* belonging to a Dog's *Leg*, the Dog will afterwards feel no pain in that *Limb*, tho' you handle it ever ſo roughly. We can therefore feel no *corporeal pain*, unleſs a *Nerve* be *hurt*, and hence according to the *different* degrees of that *injury*, *different pains* are excited in us.

2. But from thence ariſe *three* degrees of *diſtraction of a nervous part*, and of *ſenſation of pain*. The *firſt* degree is the *ſlighteſt* of all, when a *Nerve* is ſo *ſtretched*, that the mind may perceive that the *force of the Fibres* ſtill exceeds the *force uſed*; whence ariſes an *Itching* or *Titillation*, that is, ſomething between *pleaſure* and *pain*. Whatſoever therefore cauſes

the irritated part by a *ſlight tenſion* to remain in the *ſame* ſtate, will excite joy: for the mind then perceives, that the *force of the Fibres* ſtill exceeds the *force* that is uſed to the *Nerve*. The *ſecond* degree is, when the *nervous Fibres* are ſo *diſtracted*, that ſome perception of *pain* ariſes, which is greater or leſs, according to the degree of *diſtraction*. *Laſtly*, The *third* degree is, when the *continuity* is *diſſolved*; for then the *Titillation* as well as *pain* ceaſes in the *diſſolved* parts.

3. Too much *tenſion* or *diſtraction* cauſes *pain*, *two* ways, 1. On account of what preceded the *ſolution* of the *nervous Fibrillæ*; ſuch as *inflammation*, *eroſion*, &c. whence ariſes a *diſtraction* of them: 2. On account of thoſe which follow thi[illegible]*lution*, namely the *deſtruction* of the tenor of [illegible]bres; ſo that what before was ſuſtained by fi[illegible]es for example, is ſuſtained after the *diſſolution*, only by *one*. Let A B C D, in the *figure* adjoined, be a *Nerve*, conſiſting of ſome Fibres; if now any cauſe *diſſolves* the Fibres contained between C D, which ought *all* to ſuſtain the *impetus* or *force* of the points A B, in ſuch a manner that *one* only remains uninjured, then this will be obliged to ſuſtain the whole *force* of thoſe points; and thence a *pain* will ariſe: but if that alſo be *broken*, then all *ſenſation* and *pain* will be loſt in that part.



4. Pain may be produced, 1. By all things which *diſtend* the Veſſels *internally*; becauſe ſometimes a *rupture* of the moſt tender Veſſels follows from that diſtenſion: 2. By whatſoever preſſes the Veſſels externally, for the ſame reaſon. 3. By whatſoever too much diſtends the *Fibres* in any manner; as *diſtortion* or *luxation*: 4. By whatſoever *diſſolves* ſome Fibres, leaving the *reſt* untouched:

touched: but *continuity* may be *diſſolved* either by a *mechanical* inſtrument, as a *Sword*, or by *acrid* Medicines, or by the action of *Fire.*

5. MOREOVER *Itching* or *Titillation* is excited, 1. By *Reddening* Medicines, which are ſo called, becauſe it is obſerved, that a *red* colour ariſes in the Body from *Titillation*: 2. By whatſoever cauſes a very *ſlight* inflammation, for thence is cauſed the firſt degree of *pain*, which is *Titillation*: thus every *red* pimple *itches*, and if too much handled, gives *pain*; thus alſo the Genitals of all Animals, when they are excited by *luſt*, *redden*, and the *Penis*, merely by thinking, with which it's little Nerves are irritated, *reddens*, and is *extended*: and thus every [illegible] a ſort of inflammation. Now an inflamm[illegible]ſes from the paſſage of the Blood out o[illegible]*t* Arteries into the *firſt* Veins being obſtruc[illegible]; whence the *thicker* part is ſtopped in them, whilſt the *thinner* flows thro' the *lateral* Veſſels: and thus a *redneſs* ariſes.

THE cauſes of *redneſs* are, 1. All *Frictions*, that is, *reciprocal* compreſſions and remiſſions, ſo that the Canals are ſometimes cloſed, and ſometimes diſtended; and from this *reciprocation* ariſes an *agreeable* ſenſation. 2. All *Fomentations*, or warm applications of *emollient* and *waſhing* Medicines, either *internally* or *externally*: for a *Fomentation*, by it's *warmth* leſſens the *preſſure* of the Air, and *relaxes* the Veſſels by it's *moiſtneſs*: and therefore the Blood enters them copiouſly: whence ariſes *redneſs*. 3. All *thick Plaſters*, which are *not acrid*, but *tenacious* and *glutinous*: for theſe by obſtructing the *pores*, hinder perſpiration, and thence the *humours* are accumulated. 4. *Cataplaſms* of the ſame kind, that is, Bodies wrought with *Water*, and boiled to a *tenacious* conſiſtence, being a *medium* between *Plaſters* and *Water*; hence they act with regard to *Water*, as *Fomentations*, and with regard to *tenaciouſneſs* as *Plaſters*. 5. All *Suctions*, whether by *Leeches*, *cupping Glaſſes*, or by any other means; for by taking away the *preſſure* of the Air, they draw the Blood into the parts where they are applied. 6. Any *heat* that exceeds the *heat* of our Body; for that increaſes the motion of the Fluids. 7. All *ſtimulating Acrids*, which penetrating through the *Fibres* of the external parts, that is, of the *Epidermis*, Cuticle, or Scarf-ſkin, and inſinuating themſelves into the pores that lie neareſt under it, *fix* themſelves into the *ſides* of the Veſſels; and being driven by the *vital motion* of the Liquids, ſo *act* upon the Veſſels, as to place them in the firſt degree of diſtribution.

SUCH are, 1. All *aromatic Pla*[illegible]hich *Salt* and *Oil* predominate: as *Rue*, *M*[illegible]*ater* and *garden Creſſes*, *Scurvy-graſs*, *Rad*[illegible]*ettles*, *&c.* all which being examined by the chymical Analyſis are found to contain a great deal of *thin Oil* and *Salt*, beſides *Nettles*, being examined by the Microſcope, appear to have *bifid Darts*, which entering into our Body cauſe *tremblings* and *inflammation*; whence they are of great ſervice if applied to *paralytic*, *languid*, or *benummed* Limbs. 2. Animals of the ſame nature; for *Ants*, which afford a great deal of *Salt* and *Oil*, produce the ſame effect in our Body; thus alſo *rotten Fleſh* and *Skins* afford a *volatile alkaline Salt*, which by it's vellication produces a ſlight inflammation; and *Pigeons* alſo freſh killed, and applied warm to the Body, and left there 'till they putrify, produce a ſlight inflammation or itching. 3. All natural things, in which there is any ſort of *alkaline Salt*, either *fixed*, or *volatile*, or *muriatic*; alſo all *Acids* that are not too *acrid*; all *Oils*, or *Salts* alſo obtained either by fermentation, diſtillation, or expreſſion; provided they be not too acrid. Now this inflammation, or *itching*, or firſt degree of *pain*, has two effects; (α) the attrition of the Solids, (β) the derivation of a greater quantity of Liquid into the lateral and ſecretory Veſſels.

6. THE *ſecond* degree of *pain* is excited by all *Epiſpaſtics*, that is, Medicines which derive the Liquid into the part to which they are applied, with ſuch force as to *burſt* the moſt tender Veſſels. This *extravaſated* Liquor is retained by the *unbroken* Cuticle, which is elevated into *bliſters*: and therefore *epiſpaſtic* Medicines muſt conſiſt of *acrid* and *ſubtile* parts, which paſſing thro' the *unhurt* Cuticle, can *fix* themſelves into the ſides of the Veſſels appropriated to *Sweat*, *perſpirable matter* and *Lymph*, and *burſt* them, but not deſtroy the Cuticle, becauſe it has but *few*, if *any* Veſſels; and therefore the *vital power* in it muſt be very *weak*.

THE Medicines which produce the ſaid effect are 1. All *Phænigmi*, or *reddening* Medicines applied for a long time; for thus *Muſtard-ſeed* at firſt cauſes a *redneſs*, but if it remains for two hours, raiſes a *bliſter*. 2. Whatſoever abound with an *acrid volatile Salt* and *penetrating Oil*, as *Ranunculus* or *Crow-foot*, *Roots* of *Thapſia* or *deadly Carrot*, of *Horſe-radiſh*, of *Spearwort*, of *Sow-bread*; alſo *Onions*, *Garlic*, *juices* of *Euphorbium*, *Spurge*, *Thorn-apple*, and ſuch like *acrid purging juices*; alſo *Saponaceous Lyes*, applied for a long time; *acrid Ferments*; *dung* of *Pigeons*, eſpecially thoſe which feed much on *Beans*; for hence *Pigeons dung* obtains the greater quantity of *acrid Salt*: laſtly, *Cantharides*, and alſo ſome *Poiſons*; the ſtings of *Bees*, *Waſps*, *&c.* 3. *Fire*, which when it is *ſlow*, only cauſes a *redneſs*, but if *increaſed* excites a *bliſter*; and that even on *dead* Bodies, becauſe it has a motion in it's ſelf; whereas other *Veſicatories* are *ſluggiſh* on this occaſion, and are drawn into *action* from another cauſe. 4. All *alkaline Salts*, whether *volatile* or *fixed*; all *acrid aromatic Oils*; alſo *putrified Urine*, *rotten Fleſh*, *&c.* Theſe therefore are to be applied, where greater motion is required, to *diſſolve* the *obſtructions* of the Veſſels, and drive them out by ſtimulation.

COR. I. ALL theſe Medicines, except Fire, perform the office of an *inſtrumental* cauſe.

COR. II. BUT they act only on the *ſolid* parts.

7. THE *third* degree of *pain* is excited by *Eſcharotics*: but an *Eſchar* was called by the Ancients *focus Deorum*, or the *fire of the Gods*, and thence it came to ſignify the *cruſt* made by the force of Fire. They differ therefore from *Veſicatories* in degree only, as they lacerate the Cuticle, and corrode the Fleſh. Of this Claſs are, 1. *Eſcharotics* properly ſo called, which deſtroy the Veſſels, ſo as to cauſe the Liquids to be poured out: and the fineſt part of them being *fled away*, there follows an *inſpiſſation*, then an *exſiccation*, and laſtly a *cruſt*, which hinders the evaporation of the Liquor burſting out of the broken Veſſels; whence the Liquor by ſtagnating becomes *acrid*, and by corroding penetrates farther, and deſtroys every thing, as if it was *Fire*. 2. All *vegetable*, *animal*, and *foſſil* Bodies, in which there is ſuch a *force*, as may deſtroy the Veſſels, and expel the Liquids, and by inſpiſſating the fineſt part of the Liquid bring on a *cruſt*: after this manner *act Vitriol*, *Arſenic*, *Aqua Fortis*, *Lapis infernalis*, and ſuch like. Hither alſo the ancients referred the following; (α) *Cauſtics* of which actual *Fire* is the principal; whence thoſe things, which act after the manner of *Fire*, are called *Cauſtics*, and are (1) *acid foſſil Spirits* from *Salts*, for example, from *Sea-ſalt*, *Nitre*, *Vitriol*, and alſo from *Sulphur* diſtilled by the force of a very ſtrong Fire; (2) Metals diſſolved in thoſe *ſaline acid Spirits*; and reduced

into *Cryſtals*; as *Cryſtals* of *Gold* and *Silver*, and *Mercurials*. (3) *Semi-metals* diſſolved in the ſame *Spirits*; as *Cobaltum*, *Antimony*, *&c.* (4) *Alkaline Spirits* of Animals, which may be drawn from all parts of Animals, except Chyle and Milk: for in diſtillation, after the *Water* or *Phlegm* which comes off firſt, the *volatile Salt* aſcends, and then a *ſtinking Liquor* which is the *Spirit*, and which being applied to the Body is an immediate *Cauſtic*. (6) *Acid Spirits* prepared in like manner from Vegetables. (7) Juices of the moſt acrid Vegetables, as of *Crow-foot*, *Spurge-laurel*, *Euphorbium*, *&c.* (8) *Septics*, which cauſe ſuch a change in the *Fleſh* of a *living* Body, as is wont to happen to a *Carcaſs* expoſed to a *moiſt* and *warm* Air, namely *Putrefaction*. For the humours of a *Carcaſs* being agitated by the power of *heat* are moved, and a way is opened for them to *evaporate* by the Liquid *ſoftening* the Fibres; wherefore the *aqueous*, *balſamic* parts of the humours, being *ſubtile*, preſently fly off; which being removed, a moſt ſtinking and acrid *volatile Salt* breaks forth; whence it comes to paſs, that the Solids and Liquids which remain, turn into one *diſſolved* and *putrid* maſs, that is, the *Carcaſs putrifies*; a like *Putrefaction* is cauſed by *Arſenic*, being *mixed* with roaſted *Onions*, that preſerve their moiſture; alſo by *corroſive ſublimate Mercury* being *mixed* with moiſt farinaceous ſubſtances, and Cataplaſms.

COR. I. ALL Medicines whatſoever, that *excite pain*, from the firſt degree of *titillation*, to the laſt of *deſtruction*, differ *only* in degree, as ſome operate *more* and others *leſs* violently.

COR. II. NONE of theſe Medicines, except *Fire*, act by their own *power*; for if they are applied to a *dry* Skin, and there remain unmoved, they *do* nothing; but if they are mixed with the

Liquids in the Body, which is always in motion, they produce vehement effects; thus the ſtrongeſt *Oil* of *Vitriol* congealed has no effect, if applied to a dry part; but has a violent one, if mixed with the Liquids of a *living* Body.

Cor. III. *HEAT* is the *exciting* and *ſtimulating* cauſe of all theſe Medicines, ſo far as it increaſes the velocity of their motion; for *Septics* applied *hot* are wont to operate with the greater effect. Theſe Medicines therefore will be, according to their *different* degrees of *heat*, either *ſtimulating*, *attenuating*, or *putrifying*.

Cor. IV. The cauſes laſtly which excite theſe Medicines into *complete action*, are *heat* and *moiſture* together; for it is not ſufficient, that they be diſſolved in the *moiſture*, unleſs *heat* is added for a *Stimulus*; whence they act beſt of all on our Body, becauſe of it's *heat* and *moiſture*.

Thus far concerning Medicines which *operate* on the Solids; now let us paſs to thoſe which *act* on the Fluids.

PART II.

OF MEDICINES Which ACT on the *FLUIDS.*

I HAVE ſaid already, that our Fluid may be conſidered, either with regard to the particles of it's *laſt Solids* taken ſeparately, or ſo far as it is a *maſs*, compoſed of thoſe particles. Being conſidered in the *former Senſe*, it may undergo four changes; 1. Any particle may be augmented or diminiſhed in it's own bulk only; 2. It may receive this or that Figure; 3. It may be rendered more or leſs ſolid; 4. It may be moved one way or another. But being taken in the *latter ſenſe*, it may be carried either by a quicker or ſlower *projectile motion.*

CHAP. I.

Of Attenuants or Reſolvents.

ATTENUANTS are thoſe, which have the power of reducing each of the Moleculæ of a Liquid into ſmaller ones ; and they are called alſo *Reſolvents*, as they *reſolve* the *Moleculæ* of the Liquids which preternaturally coaleſce into a natural ſtate: both of them therefore always act by *dividing*.

2. *DIVISION* may be brought about *two ways*; 1. When the *dividing* Body inſinuates it's ſelf into the pores of that which is to be *divided*, and ſeparates it's parts from each other; 2. By the external *attrition* of different Bodies. The *firſt* is not brought about by the *Fluids*, or by thoſe which have the nature of Fluids; the *latter* obtains in all thoſe, which can excite a motion in our Liquids.

3. MOREOVER it is to be obſerved, that the *powers* of Medicines are to be determined not only by reaſon but by experience; that we may not fall into errors, as thoſe are wont, who gather from the *fluidity* of Spirit of Wine, that it is endued with an *attenuating power*; whereas it quickly *coagulates* the Blood, as we learn from experience. This caution being given, *Attenuants* therefore are all thoſe natural Bodies, which take away from particles their *endeavour* to *cohere*.

4. THAT *endeavour* may ariſe from *two* cauſes; 1. From the *Attractive Power* of the particles, which ſeems to be in every particle of matter, but is not yet ſufficiently known and explained; 2. From a cauſe preſſing *externally*; thus two mirrours per-

fectly poliſhed, and laid upon one another, are ſo vehemently urged toward each other by the preſſure of the Air, that they cannot be ſeparated without great force. But in this place I ſhall conſider the *endeavour* of particles toward each other, as proceeding only from a *poſterior* cauſe; and therefore the *Seceſſion* of the particle from each other, which is called Attenuation, is cauſed only by *taking away* the *preſſing* weight; but in our Body the *weight* is nothing elſe but the *amaſſing* of a great quantity of Liquid in ſome narrow place, whence the parts are preſſed upon each other.

5. THE beſt *Attenuants* therefore in this caſe are, 1. *Evacuations*; ſuch are *Depletion* of the Sanguiferous Veſſels, *Salivation*, *Diureſis*, *purging by Stool*, *&c.* for part of the Fluids being taken away, that part which remains in the Body has a greater liberty of motion, and an admiſſion alſo is prepared for other *Attenuants*. But it is to be obſerved, that tho' a *due Depletion* of the Blood-veſſels conduces to the *Attenuation* of the Blood, yet *too great* an one hinders it; becauſe in this caſe the Veſſels cannot contract themſelves ſo far, as to propel the contained Blood: whence the Blood ſtagnates, and is coagulated. 2. All *Diluters*, which, by the interpoſition of particles, disjoin Bodies from each other: ſuch are, (α) *Water*, which is the beſt *Diluter* of all. (β) All *volatile* and *mild alkaline Salts*; as thoſe of *Hart's-horn*, *Blood*, *Urine*, and ſuch like, which are prepared from the parts of Animals. (γ) All *fixed alkaline Salts*, of incinerated plants, but ſuch as are not very acrid, for fear they ſhould corrode. (δ) All *volatile ammoniac Salts*; which conſiſt of a *volatile Salt* and *Acid* united, but in ſuch a manner that not the *Acid* but the *Alkali* predominates; for otherwiſe they would coagulate. (ε) All *acrid oily volatile Salts*, compoſed of a volatile Salt and Oil. (ζ) All *foſſil*

foſſil Salts, as *Sea-ſalt*, *Nitre*, *Borax*: but not *metallic* Salts, for they thicken, becauſe they conſiſt of Earth diſſolved in *Acids*. (η) All *artificial Soaps*, which, without exception, always reſolve and attenuate: alſo the *natural Soaps of plants*, that is, their aromatic juices. (ϑ) *Extracts* made of them. (ι) All *Wines*, provided the *Acid* does not predominate in them. 3. All that comminute the parts of the Liquids by attrition: and this may be done *two* ways; (α) by increaſing the inteſtine motion of the Fluids, and (β) by increaſing the force of the Solids.

6. THE *inteſtine motion* of the Fluids is increaſed after *four* manners. 1. By heat: but in truth this has very little effect here; becauſe our *natural heat* is not the *cauſe*, but the *effect* of the attrition of the flowing Liquid: but *artificial heat* dries, if it is great, and has no effect if it is ſmall: and indeed a *warm moiſture* only can be of uſe in this place, as *fomentations*, *baths*, *&c.* in the uſe of which however it often happens, that tho' they are well tempered, yet the condition of the Patient cauſes them to coagulate inſtead of attenuating. 2. By *efferveſcence:* but this, as it is defined by the Chemiſts, to be a *fight of oppoſite Salts with one another*, *with great heat and motion*, cannot happen in our Bodies; nor can that which is between *acid Spirits* and *Oils*, as between Spirit of Wine and Spirit of Nitre; nor that which is between *terreſtrial* Bodies and Acids. 3. By *fermentation*; but neither can this happen in our Bodies; becauſe the requiſites to *fermentation* are wanting; wherefore neither can the *effect* of this, that is, the production of *ardent Spirits* be ever found in our Liquids. 4. From *putrefaction*; but as this obtains only in Liquids that are corrupted, or juſt ready to be corrupted, if it was to happen in our Body, we muſt in a ſhort time he

deſtroyed. And thus none of theſe *four* cauſes, except the *warm moiſture*, conduce at all to the *attenuation* of the Liquids in our Body.

7. THE *motion* of the Solids is augmented in us after *two* manners, 1. By thoſe things, which excite great *oſcillations* by their *external force*; 2. By *internal ſtimulaters*: to this belong *frictions*, which by *alternately* compreſſing and relaxing the ſurfaces of the Veſſels, increaſe their *motion* and *attrition*.

COR. I. IT is manifeſt therefore from what has been ſaid, that the action of *Attenuants* and *Reſolvents* cannot be ſo eaſily conceived and determined, as ſome imagine: for thus we often wonder, why a *ſlight* inflammation cannot be diſſipated without great difficulty, as alſo why the Blood extravaſated and coagulated by a contuſion ſhould remain long; when the reaſon of this is, that Medicines ought to act rather on the affected part than on the *whole* Body: but how ſhall they receive a *determination* to that part? For let us ſuppoſe that any one, to attenuate the Blood coagulated in any part of the Body, ſhould take *ſix grains* of ſome *volatile Salt*; this quantity will be mixed with the whole maſs of Blood; which is at leaſt *thirty pound*: how little a part then will come to the affected part, by the laws of circulation.

COR. II. IT is the part therefore of a prudent Phyſician, to be careful rather, that the Blood do not coagulate, than to endeavour to *reſolve* it when coagulated.

CHAP. II.

Of Incraſſating or Condenſing Medicines.

1. AN *Incraſſating or Condenſing Medicine is that, which expelling the finer particles of the Liquids binds the thicker more ſtrongly together.* It appears by experiments made in *England*, that Bodies have, beſides their *ſolid* parts, many *Pores*, which may *phyſically* be taken for *Vacuums*, and do not reſiſt the entrance of another Body: an *Incraſſating* Medicine therefore *acts* by leſſening thoſe *Pores*; which is brought about by the *compreſſion* of the *ſolid* parts, ſo as to make them approach nearer to each other: but this cannot be done without the expreſſion of the *more liquid* and *finer* particles.

2. INCRASSATING Medicines are, 1. All vehement heat, whether it ariſes from *Fire*, the *Sun*, or from *Friction:* the effects of this are, to *move* the Liquids, and therefore to increaſe their *attrition* againſt the Veſſels; whence follows an *expulſion* of the *moſt Liquid*, the thicker and leſs moveable being *left*, which then *unite:* and therefore there is no Liquid in our Body, which is not *thickened* by the *Fire*; therefore *heat thickens* the Liquids: and if it ſometimes *diſſolves* them, it does that by *acting* on the Solids, and *ſtimulating* them; but it never attenuates the Fluids *immediately* by it's ſelf: nay when the *Stimulation* is ended, there begins an *Inſpiſſation.* 2. All *muſcular motion*, that is too vehement, for it firſt increaſes the Sanctorian Perſpiration, and then expels the Lymph under the form of Sweat, and that which cannot be preſſed out is *inſpiſſated*, or thickened: the ſame *motion* ſometimes

attenuates, provided it be not too vehement; which it does by increaſing the *contractile power* of the Solids, and promoting their *action* on the Fluids: but if this *muſcular motion* is too much exerciſed, then, as HIPPOCRATES obſerves, the Blood is in a manner boiled, and there ariſes a *burning Fever*, unleſs it be prevented by drinking *Water*. 3. A too vehement *circulatory motion* of the Blood; for this increaſes the applications of the particles to the ſurface of the Veſſels; for the velocity of one Fluid is to that of another, as this application is to the application of the other; therefore if the velocity of the *projectile motion* be double, the reſt being equal, the derivation alſo toward the *lateral* Veſſels will be double; and as theſe are leſs than *ſtrait* ones, they will admit only the *moſt liquid*, and that in ſufficient plenty: whence the particles which are carried *ſtrait* forwards will be *thickened*, and become in a manner *ſolid* by the *vital power* preſſing behind. Moreover this *motion* alſo ſometimes *attenuates*, but not unleſs a great quantity of Liquor be *drank* in the mean time, to reſtore the *loſt* Liquid. 4. Every *excretory motion* too much increaſed; becauſe the *moſt liquid* are too much drawn out of the Body, as happens in too great Sweats, Purgings, a Diabetes, &c. 5. Any Cauſe compreſſing the Veſſels *externally*; for this expels the *moſt liquid* parts: as appears in thoſe who enter *Mines*, where the *preſſure* of the Air is great; for firſt they grow *cold*, becauſe the transflux thro' the *moſt ſmall*, *extreme* Veſſels is hindred a little; but ſoon afterwards they *ſweat*, not from the *heat* of the place, as we find by the Thermometer, but becauſe the *force* of the Heart remains, while the *capacity* of the Veſſels is diminiſhed: wherefore the ſame quantity of Liquid is carried thro' the Canals now made *narrower*; whence there is a greater *motion* and *attrition*, and conſequently a *Sweat*. 6. All kinds of Medicines, that can either excite or increaſe the *preceding:* ſuch are all Medicines that are *Stimulating*, *Sudorific*, *Emetic*, *&c.* the abuſe of which thickens the Liquids. Hence in ſuch *Diſeaſes* as depend on the *thickneſs* of the Humours, it is of ill conſequence to give *Sudorifics*, when on the contrary *Diluters* are indicated.

COR. I. ALL *Remedies* which *thicken* the Blood to a due degree, *ſtrengthen* our Bodies and diſpoſe them to *long Life*. For if a *due thickneſs* of the Blood is wanting, the Liquids are derived in too great plenty into the *lateral* Veſſels, and ſeparate from the Body: whence the *ſtrength* periſhes; which conſiſts in the *magnitude* of the Veins and Arteries, and *due thickneſs* and *firmneſs* of the Blood flowing thro' them; as plainly appears in the Blood of ſtrong labouring Men, when it is drawn out of their *Veins*.

COR. II. WHEN the Blood is too *thin*, it may again be *thickened* by a ſtrong *motion* of the Muſcles: as may be obſerved in *Conſumptive* Perſons.

CHAP. III.

Of Medicines cauſing Acrimony.

1. BY *Acrimony* I underſtand *that Figure of a Body, by the help of which it may apply it's mechanical force to another Body according to a ſmall ſurface.* But now *acrid* Bodies may be infinite with regard to their figure; for they may be either *conical*, or *pyramidal*, *&c.* Thus a Sword, a Knife, an Inclined Plane, a Wedge, *&c.* are *acrid* Bodies. But the Force or rather the *Momentum* of them,

as well as of all Bodies, may be conſidered *two* different ways; either *abſolutely* or *ſpecifically*: an *abſolute Momentum* is that which is had from the Velocity of a Body multiplied by it's Weight; the *Specific* is taken from the Reſiſtance conſidered with the *abſolute Momentum.* For example, if there are *two* Bodies, *one* of which has *one* degree of Weight, and *one* of Velocity; and the other has *two* degrees of Weight, and *two* of Velocity, then the *abſolute Momentum* of the firſt will be to the *abſolute Momentum* of the ſecond, as the Velocity of the firſt multiplied by it's own Weight, to the Velocity of the ſecond multiplied by it's own Weight, that is, as 1 to 4. If now we ſuppoſe, that theſe Bodies in another Reſiſtance, are *impinged* by this law, that the Reſiſtance which the ſecond finds, is *four* times greater than that which the firſt finds; their *ſpecific Momenta* will be equal: but if the Reſiſtance of the ſecond exceeds *that* of the firſt in a ſtill *greater* proportion, then the *ſpecific Momentum* of the firſt will exceed the *ſpecific Momentum* of the ſecond. Hence alſo the *ſmaller* the *reſiſting* Superficies is, on which any *acrid* particle *impinges*, and the more Weight and Velocity this particle has, the *greater* will be it's effect.

2. EVERY *mild* Body is capable of becoming *acrid*, and ſo on the contrary: but the *Acrids* in us may be of *two* ſorts; thoſe which *ſpring* there, and thoſe which are brought from without. Thoſe Bodies alſo which are *mild*, become *acrid* two ways; 1. By changing their Figure; 2. By removing the Sheaths, with which the *Acrids* were covered: but in a *healthy ſtate*, there are hardly any *Acrids* in us; for if there are any, they are preſently drawn out of the Body, as Bile and Urine. Therefore there are no *innate Acrids*, except theſe two: for the *aqueous* part, which conſtitutes the greateſt part of

the Liquids in us, never becomes *acrid*; as appears in the diſtillation of Blood. Our *terreſtrial* parts are hardly ever changed into *acrid*, at leaſt it does not yet appear by experiments; ſometimes indeed, as in the Stone and Gravel, there are *acrid* particles; but theſe are *ſaline* particles mixed with the *terreſtrial*; and therefore the *Acrids* are to be ſought for in other parts. Our *Oil* is a *moſt mild* ſubſtance, for when dropped into wounds it lenifies them; but yet it is eaſily changed into an *Acrid*, for if any one ſhall have taken much *Oil*, he will ſoon throw up *nidorous Eructations*, and this *Oil* will be changed into a *moſt acrid* ſubſtance, burning and exulcerating the very Bones. *Salts* will alſo become *very acrid*, if they ſuffer *attrition* by too much motion and heat; and they have *three* cauſes for becoming *acrid*. 1. Every thing that increaſes the *Velocity* of the Blood, and conſequently it's attrition, wonderfully produces *acrid Salts* in us. 2. Whatſoever *attenuates* the Liquids, makes the *Salts* for the moſt part *acrid*; for thereby the *Angles* are multiplied, on which *Acrimony* depends. 3. Every manner of *reſolving* does the ſame; for the parts which had concreted, being *reſolved* and freed from their globoſe texture, become *acrid*. Moreover *Acrimony* is produced in us by *Putrefaction*, which follows *Stagnation*; for by the heat and motion of the neighbouring Veſſels, there is formed an *attrition* in the *ſtagnating* humour, and thence a change of it's *Figures*.

3. THERE are *three* kinds of *Acrimony* produced in our Bodies; 1. An *acid Acrid*; which is cauſed by the ſtagnation of Vegetable food; for if it remains long in the Stomach, it grows very *acrid*, unleſs ſome *animal* ſubſtance be mixed with it; But *Milk*, tho' it is an *animal* humour, is not to be excepted; for that often turns *acid* in the Stomach. 2. An *oily Acrid*; for all the Liquids of our Body,

if they are expoſed to any *heat* which is equal to the *heat* of our Body, are preſently diſſolved, and raiſe a great *ſtink*, that is, *putrify*: which *putrefaction* proceeds from the *volatile Salt* and *Oil*; for if you diſtill the *Salt* and *Oil* from them, what remains will have neither ſmell nor taſte: but if the *Oil* is freed from the *Salt*, it no longer *ſtinks*; whence it appears, the *Oil* has it's *putreſcence* from the *Salt*, which muſt however be diſſolved, to excite a *ſtink*. 3. An *alkaline Acrid.*

4. THE *Acrids* which are brought into our Bodies from without, are diverſe; 1. *Foſſils* and *Minerals*, which enter the Body with their powers entire, and are not eaſily changed; as *Sal Gemmæ*, *Borax*, *Sal Ammoniac*, *Vitriol*, *Nitre*, and alſo all *metallic Salts*: hither alſo belong *terreſtrial* Bodies, as *Alum*; and Oils falſly ſo called, as *Petroleum*. 2. *Acid Acrids*, which are either *volatile*, or *natural*; as all *Juices of ſeaſonable fruits*, as *Cherries*, *Apples*, &c. or *made by art*, namely by Fermentation, for thus of *Muſt* is made *Wine*, and of *Wine* is made *Vinegar*, which indeed are the ſlighteſt *Acrids*: but the *fixed* are more ponderous, and therefore *more acrid*; for the heavier any *Acid* is, the more *acid* it is, as appears by *Vinegar* and *Oil of Vitriol*, for the Weight of the former is to that of the latter, as 1 to 3: the *fixed Acids* are all *foſſil Salts* brought to flow into a Liquid, as *Oil of Vitriol*, &c. 3. *Alkaline Acrids*, which are either *volatile* or *fixed*; and theſe laſt have an Earth added to them, from which the *volatile* are free; hence alſo the *fixed* are more *acrid* becauſe more heavy. 4. *Oily Acrids*; and theſe are either *expreſſed* or diſtilled; the *firſt* are always *mild* of themſelves, but in time become *acrid*: but the *latter* are almoſt always *acrid*; and if they are not digeſted in us, and ſubdued by the *vital powers*, become *moſt acrid*, ſo as even to burn like

Fire: and theſe are at the ſame time acrid and tenacious. Hither muſt be referred the *ſpirituous*; ſuch as all *fermented Spirits*, which are moſt acrid, as appears from *Spirits of Wine*. 5. *Salts* of Vegetables; which are either *eſſential*, as *Honey*, *Manna*, *Sugar*; or *artificial*, which are turned by the *force* of cold, from the *expreſſed juices* of ripe ſucculent Plants *inſpiſſated* by heat, into *Cryſtals* diſſolvable in *Water*; and all theſe are more ſluggiſh: or elſe are produced by *fermentation*, as *Tartar*, which after the depuration of *Wine*, adheres to the ſides of the Veſſels. 6. All *aromatic Acrids*, which abound with Oil and acrid Salt conjoined; for theſe are *hot*, *odorous*, and of an *acrid taſte*; as *Pepper*, *Ginger*, *Onion*, *Garlic*, *Cinnamon*, *Caſſia Lignea*, *Cloves*, *Nutmegs*, *Mace*, *Cardamoms*, *Galangal*; and alſo all our *Aromatics*, which grow in *Europe*. For all theſe act by *ſtimulating*, but if they are taken in too great quantities, *burn* the Stomach, and the other Bowels. 7. All that *excite pain:* concerning which compare the CHAPTER *of Solvents*.

CHAP. IV.

Of DEMULCENTS.

1. *DEMULCENTS, or aſſuaging Medidicines are thoſe, which obtund the acrid particles of our morbid humours*; which they do, not by changing their *Figures*, but only by involving them, and incloſing them as it were in a *capſule:* and in this ſenſe a *Sheath* containing a *Knife*, *Needle*, or any other *acrid* or ſharp cutting inſtrument, may be ſaid to *aſſuage* their *Acrimony*.

2. Now *Demulcents* are of *two* ſorts, either *general*, which *involve* all kinds of *Acrids*, of whatſoever nature they are, indiſcriminately and equally; or *ſpecifical*, which *obtund* only a certain ſpecies of *Acrids*.

THE Claſſes of *general Demulcents* are the following.

1. ALL *oily* Bodies, contained under theſe *four* heads; 1. *Oils recently expreſſed* or *freſh drawn*, from *Almonds*, *Filberts*, *the four greater and leſs Cold ſeeds*, *Poppy ſeeds*, *&c.* 2. Any *aqueous Infuſions* from farinaceous ſeeds reduced into a tenacious Mucilage; as of St *John's Wort*, *white Lilies*, *Nightſhade*, *Violets*, *ſweet Trefoil*, *Mullen*, *Quinces*, *&c:* 3. The only *diſtilled Oil* that is not *acrid*, namely, *Oil of Wax.* 4. The *native Oils* of Animals, as freſh Butter, Cream, *Fat* ſecreted and collected, eſpecially the *Marrow* of Animals; alſo the *Fat* about the Bones, eſpecially that gathered about the Meſentery and Kidneys; alſo the *Fat* of *Hens*, *Geeſe*, *Ducks*, *&c.* Now theſe *Demulcents* are of moſt excellent uſe, where there is a ſign of much *Acrimony*, nay the *moſt acrid* Poiſons may be enervated by them: they are alſo taken *internally*, and are of great ſervice, when the Blood abounds with *acrid* particles; thus in the worſt ſort of Scurvy, if the *Patient*, tho' ever ſo languid, takes ſeveral times faſting, *Cream*, *freſh Butter*, or what is beſt of all, the *Marrow* of Animals, he will be wonderfully cured; thus alſo *Marrow* is of very great ſervice to thoſe, whoſe Bones are ſo dry, that they cannot be moved without making a noiſe; nay in the *wandring* Gout, which is called Rheumatiſm, nothing is of more ſervice, than to take ℥ij. *of Linſeed Oil* every morning.

2. ALL *inſipid*, *inodorous* and *ripe Plants*, which yield no *Oil*, whether taken in the form of Emulſion, Infuſion, Decoction, or any ſort of Paſte:

thoſe who cannot bear the *Crude Oils* contained in CLASS I. N° I. may take theſe; for in theſe the *oily* parts *lie hid* involved in others. They operate alſo partly by means of their *Glew*, which inveſt the *Acrids* in our Body, and partly by means of their own *covered Oil*: ſuch are, Decoctions of *Marſh Mallow*, *Borrage*, *Mallow*, all ſorts of *Graſs*, *Acanthus*, or *Brank Urſine*, *Mercury*, *Pellitory*, *Violets*, *Mullen*, *white Lilies*, *Cucumbers*, *Pompions*, *Melons*, *Citrulls* or *water Melons*, *Lettuce*, *Poppy*, *Comfrey*, and *Water Lilly*; alſo the *ſeeds of Quinces*, the *juice of Strawberries*, *&c.* For all the preparations of theſe are *demulcent*, and it ſignifies but little of what ſort they are; thus a *Conſumption* may ſometimes be cured only by the taking of *Lettuce*: but it muſt be obſerved that theſe are of no ſervice, where the *acrid* is *tough* and *thick*, but are of great benefit in a *hot acrid*; whence the Ancients preſcribed *Lettuces*, *Mallows*, *Cucumbers*, *&c.* againſt Poiſons.

3. ALL *Seeds*, out of which Oil may be expreſſed, and of which *Pultes* or Emulſions may be made: ſuch are *Almonds*, *Piſtachio Nuts*, *Barley*, *Oats*, *Wheat*, *Rie*, *Rice*, *Millet*, *Walnuts*, *Filberds*, *ſeeds of Pompions*, *Water-Melons*, *Lilies*, *Water-Lilies*, *Flax*, &c.

4. *VISCOUS and inſipid Gums*; eſpecially *Gum Tragacanth*, the Gum of *Cherry*, *Apple*, *Pear-trees*, &c. diſſolved in *Water*: for theſe operate beſt of all, and even cure the making of bloody Urine in the Small-pox.

5. ALL the *ſucculent* and *concreſcent* parts of ſound Animals, except the Bile and Urine, for any of them may be applied either to the *Eye* or a *Wound* without any ſenſe of *pain*: alſo all *Gellies*, which may be obtained by boiling parts of Animals, are in this caſe of ſervice, thus *Eggs*, *Fleſh*, and all our *Solids*, except the Fat, may be reduced to a *Gelly*;

Gelly ; for *Gellies* are nothing but the *nutritious juices* that are *ſeparated* out of the *Solids* by the force of boiling ; as appears from *Harts-horn*, for after boiling, there remains nothing but a *caput mortuum* ; thus *Fleſh* alſo boiled to the conſumption of the moiſture, if it is diſtilled, yields only an *empyreumatic Oil* : thus alſo *Gellies* and *Decoctions* of Tendons, Membranes, Inteſtines and Bowels are *Demulcents* : wherefore innumerable *Diſeaſes* that ariſe only from *Acrimony*, are eaſily cured by a *Diet* of ſuch *Broths*.

THE Claſſes of *ſpecifical Demulcents* are the following.

1. ALL *terreſtrial Abſorbents* : of which ſome, tho' on account of their figure they may be thought to wound and injure, yet are *demulcent* ; for if they meet with an *acid Acrid*, they enervate it by *abſorbing* : thus the *filings of Steel*, have *acrid ſpicula*, yet they enervate *Oil of Vitriol*. The *Abſorbents* of an *Acid* are, *Crab's-eyes*, *calcined Shells*, *Corals*, all *Pearls*, all *Shells* of the *Oyſter* kind, *Mother of Pearl*, all *Bones* of *Fiſhes*, all ſorts of *Calx* remaining from the burnt parts of Animals : all theſe I ſay *abſord* an *Acid*, and being united with it form a third kind of Body which is ſweet. Hither alſo belong ſome *ſtones* ; as *Bezoar*, *Lapis Hyſtricinus*, called alſo *Pedro del Porco* (a) ; but theſe ſtones, if

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(a) This *Stone* is brought to us chiefly from *Malaca*, a Country in the *Eaſt Indies*, and is called by the Natives *Maſtica de Soho*, by the *Portugueſe* and *Spaniards*, *Pedro de Vaſſar*, and *Piedra de Puerco*, and by the *Dutch* generally *Pedro del Porco*, and in the Shops *Lapis Porcinus* : for it grows in the *Gall-bladder* of a ſort of *Hog* or *Porcupine* ; whence it is called *Hyſtricinus*, and by ſome thro' miſtake *Lapis Hyſtericus* : whereas this latter is different from it, and is found in *New Spain*, and is not a ſort of *Bezoar*, as the former is. But as to the *virtues* of the *Lapis Porcinus*, ſo much cried up by Empirics, as it is of a *ſaponaceous* nature, being formed of indurated if they are *inſipid*, have no other *power*, than that of *aſſuaging*; and if they have any *taſte*, then they may *act* after ſome other manner; thus the *Lapis Hyſtricinus*, which is of a *ſaponaceous nature*, may *act* by ſtimulating; but it has nothing *ſpecifical* in it's nature beyond other *Stimulaters*. *Acids* alſo are *abſorbed* by all *native Earths*, as *Tobacco-pipe-clay*, *Chalk*, *Armenian*, *and other Boles*, &c. alſo by ſome *Calx*'s of Metals, and by *Marcaſites*, *Steel*, *Lead*, *Tin*, reduced to powder. Theſe are chiefly oppoſite to *Acids*; and by theſe the *moſt acrid* and ſtrongeſt Poiſons may be *aſſuaged*: thus *corroſive Mercury*, if well rubbed with *filings of Steel*, becomes *harmleſs*; and *Vitriol*, which is ſaturated with *Steel*, is an *innocent* Medicine; thus alſo the *Lapis Infernalis* may be deprived of all it's *cauſtic power* by *filings of Steel*, or ſuch like, nay if it be only rubbed with *Crab's Eyes*.

2. ALL *Acids*, with regard to *Alkalines*, are *demulcent*, tho' being conſidered by themſelves they may be *moſt acrid*: ſuch are, 1. The *freſh juices* of ripe and acid Fruits; as of *Cherries*, *Medlars*, *Grapes*, *Pears*, *Apples*, *Currants*, *Mulberries*, *&c.* which are the moſt excellent Medicines in thoſe *Diſeaſes*, where it appears that an *Alkali* predominates; as in the Plague, Small Pox, Meaſles, burning Fevers, *&c.* *ſubacid Whey*, *Butter-milk*, and *Milk* it's ſelf beginning to turn *ſower*: for theſe are able to *obtund* any *Alkali*, either *fixed* or *volatile*; thus TULPIUS obſerved a very bad *Diarrhæa*, ariſing from the predominating *Alkali* of the *Bile*, to be healed only by the uſe of *Butter-milk*; it has been

rated and concreted *Bile*, it may be thought a good Medicine in many caſes; but yet it does not ſeem worthy of ſuch high eſteem, as it meets with amongſt many, and perhaps is of no more value, than other *ſtones* found in the *Gall-bladder* of almoſt any Animals whatſoever.

been obſerved alſo that a *tertian Fever* has been cured by the frequent drinking of this Liquor. 3. All *fermented Acids*, prepared of all ſorts of *ſeaſonable Fruits* or *Meals*, which are called *acetoſe*; and theſe rather diſſolve than coagulate: hence *Moſelle* and *Rheniſh* Wines are the beſt, eſpecially if a little *Spirit of Sal Ammoniac* be added, in thoſe Diſeaſes, in which the *Thirſt* is intenſe, and the *Bile* very much vitiated: to this place alſo belong *diſtilled* and *fermented Acids*, alſo crude *Tartar*, which is a *dry Vinegar*: of this Claſs alſo are *Pultes* kept warm for ſome days, and thence growing *ſour*. 4. All *Acids* from the more ponderous Foſſils; for theſe *abſord* the *Alkali* very much, but before they *abſord*, make the greateſt corroſion: and theſe are either *native* as *Petroleum*; or *made by art*, namely, being diſtilled, as the *Spirits of Sea Salt*, *Sulphur*, *Vitriol* and *Nitre*; but the *Alkalies* being ſaturated conſtitute a *mild* Body, as is manifeſt from *vitriolated Tartar*.

3. ALL *Alkalies* with regard to all *Acids*; but by *Alkalies* are generally underſtood *three* kinds of *Salts*; namely, 1. All *fixed Salts* extracted from burnt Vegetables; and theſe are highly *corroding*, but oppoſite to all *Acids*; and after their *conflict* with them conſtitute a *moſt mild* Body. 2. All *volatile Alkaline Salts* prepared from Vegetables by diſtillation, after the putrefaction of the Plants. 3. *Volatile Alkaline Salts*, drawn from Animals by diſtillation, and called Urinous; moreover all putrefied parts of Animals afford ſuch a fetid *Alkaline Salt*.

4. ALL *ardent Spirits*, with regard to *Acids*: thus *rectified Spirit of Wine*, digeſted or diſtilled with ſome *acid Spirit*, as that of *Nitre*, or *Vitriol*, or *Salt*, or with *Aqua Fortis*, deſtroys their too great *Acidity*, and *dulcifies* them.

COR. THESE things being now conſidered, it appears what are the Antidotes of mechanical or chemical Poiſons; by this I underſtand all thoſe which produce their effects by means of their *figure* and *motion*; as are all *contuſed Glaſſes*, *Cryſtals*, *Metals*, *&c.* of which the Antidotes are thoſe, which ſhew themſelves to be fit to involve thoſe Poiſons. But other Poiſons act by coagulating; of which I ſhall ſpeak afterwards.

CHAP V.

Of IMMUTANTS.

1. *IMMUTANTS are thoſe, by the help of which the figures of the particles which compoſe the Fluid are ſo changed, that they thence become more or leſs pungent.* There are thought to be many *Immutants*, whereas they are very few: for in truth the *Attrition* of the Solids on the *contained* Fluids ſeems to be the ſole and only *efficient* cauſe of the immediate *change* of *figure* in the particles of theſe Fluids; for the *changes* which uſe to be made in the Fluids by *Efferveſcence* or *Fermentation*, have no place in our Body, as was ſhewn before.

2. MOREOVER from the above-mentioned *Attrition* ariſe the following *effects*; 1. The more ſlow, dull and thick particles are impinged on the *points* of other parts; whence it comes to paſs, that the more *rigid* particles are involved by the moſt *flexible*. Hence appears the reaſon, why *Salts* are ſo *changed* in us, that after twenty four hours they lay aſide all their *Acrimony*. 2. The moſt *flexible* parts of all are alſo greatly *changed*: for ſuch have

the greateſt *ſurface*, and the leaſt *ſolidity*; and therefore have the leaſt *reſiſtance*. 3. The *angular* particles are very much changed: for their *angles* are abraded, whence from being *angular* they become *globoſe* and *obtuſe*.

3. THIS Attrition alſo is *varied*, according to the *various* quickneſs of the Circulation of the Fluids in our Body: and therefore to change the Liquids is to *change* the degree of the quickneſs of the Circulation. But now we muſt inquire, what *degree* of quickneſs may ſuffice to produce this or that change. To ſolve this, let us ſuppoſe that any one has taken *various* kinds of Meats and Drinks; as *ſalted* Fleſh, *acid* things, *&c.* if the *circulatory* motion is regular, it will render all theſe *mild* and *innocent*; but if that motion is *increaſed* by any cauſe, as by a Fever, then this food will become a thick, depraved *maſs*, tending to Putrefaction.

4. HENCE therefore we conclude, 1. That a *gentle* and *equable* motion makes every thing *mild*. 2. That a leſs motion than *uſual* converts the Fluids, eſpecially the Chyle, into an *acid* ſubſtance: thus in Infants and Children, and alſo in *phlegmatic* Women, and thoſe who indulge themſelves in too much reſt, *diſeaſes* often ariſe from an *Acid*; and therefore they are helped by *volatile Salts*, *Chalybeates*, *Abſorbents*, *&c.* 3. That all the particles acquire an *Acrimony*, and that which is called a *volatile Alkali*, from *too great an increaſe* of the *velocity* or *quickneſs* of the Blood.

CHAP.

CHAP. VI.

Of DILUENTS.

1. *DILUENTS are thoſe which being mixed with a Fluid render it's parts more fluid, but ſo as not to changethem.* A Fluid is that maſs, of which the ſmalleſt particles are *continuous* to each other, but yet may eaſily be *ſeparated.* (See CHAP. I.) Therefore to render any thing more *fluid,* is to make the parts *ſeparable* from each other with *leſs force.*

2. THIS may be done *two* ways; 1. By dividing each particle into ſmaller ones; which does not belong to this place. 2. By *diluting,* or mixing with it ſomething elſe, which ought to have the three following conditions; (α) whatſoever dilutes muſt be *fluid*; (β) it muſt be *more fluid* than the humour that is *to be diluted*; (γ) after *mixing* it muſt retain it's *fluidity.*

3. THERE is no Body, except *Water,* that is endued with theſe *three* conditions; *Wine* indeed is ſaid to dilute, but it's *diluting power* depends on it's *aquoſity* joined with it's *ſtimulating power*: but *Oils* render the Maſs rather *impenetrable*; *fermented Spirits* for the moſt part *coagulate* the maſs inſtead of *diluting* it; and *Salts* are *ſolid,* and therefore have not the conditions of *Diluters,* but attenuate by ſtimulating; *Earth* alſo is *ſolid* and *ſluggiſh.* Therefore if we would *dilute,* we muſt uſe *Water.*

THEOREM I. *Water* if it is aſſiſted by *heat, dilutes* the more; therefore *warm Water* is the fitteſt for this purpoſe.

THEOREM II. *Saline* particles very much promote the operation of *warm Water* by *ſtimulating*; therefore if we take *Sea Salt, Sal Polychreſtum, Sal Ammoniac,*

Ammoniac, or *Borax* with *Water*, we ſhall obtain the beſt effect of *Dilution.*

THEOREM III. THE *increaſe* of the motion of Reſpiration, and that alſo which is voluntary, are great helps to *diluting*: hence where there is quick need of *diluting*, as in a Pleuriſy, Peripneumony, *&c.* the Perſons affected ſhould reſpire as much as they can; for beſides the effect *peculiar* to the motion of the Lungs, namely the *attenuation* of the humours, the Stomach alſo and Inteſtines are compreſſed by the ſame means; and thus there is a quicker *expulſion* of the *diluting Water*, and a *Derivation* of it into the Lacteal Veſſels; hence alſo the Chyliferous Duct is more preſſed *by turns*, whence the *flux* of *Water* thro' it is accelerated; thus alſo by a *voluntary* motion of the Muſcles the *paſſage* of the Liquids is increaſed: which is of the greateſt uſe in *Chronical Diſeaſes*; where it is manifeſt, that the Liquids are *incraſſated*: wherefore thoſe who are afflicted with ſuch *Diſeaſes*, ſhould *walk*, *run*, *leap*, and uſe all vehement *motions*, frequently drinking *Water* in the mean time; for by this means they will find themſelves much better, as alſo by *riding on horſe-back*, *in a coach*, and ſuch like.

CHAP. VII.

Of COAGULATERS.

1. *COAGULATERS are thoſe which change the parts conſtituting a Fluid into a ſtrait and concreſcent maſs, ſo that many particles are moved under one ſurface.* This may be done *two* ways; 1. By expelling the *moſt fluid* particles which lie among the reſt. 2. By uniting the parts together, by interpoſing ſomething between the parts of the *Fluid*, which may knit them together,

ſo as to make them run into *greater bulks*, and not be able to *flow* any longer. Now thoſe which *coagulate* the Blood after this manner are always *pernicious*, and can hardly be admitted within the Body, without bringing ſudden *death*.

2. THE Claſſes of Medicines, which coagulate our Fluid after the *firſt manner* are *two*; namely, 1. Thoſe which are properly called *Expriments* or Expellents. 2. *Abſorbents*, which receive the *more thin* intermediate *Liquid* within their pores, whence the remainder becomes *thicker*. The *firſt* diminiſh the plenty of our humours; and the *latter increaſe* it: but theſe do not operate ſo eaſily in us, as ſome imagine; for they cannot enter into the Lacteal Veſſels.

3. *COAGULATERS* of the *firſt* Claſs are, 1. Among Vegetables, all thoſe which being mixed with *Copperas*, are wont to produce a black and foul tincture; as *Galls*, which being mixed with our Liquids, or with Milk, the white of an Egg, or Spittle, *coagulate* them; thus alſo the *juice of red Roſes* recently expreſſed; thus alſo almoſt all *unripe juices*; and *Walnuts*, eſpecially their *rinds*; alſo the *rinds* and *flowers* of *Pomegranates*; the *unripe juices of Acacia*, *Medlars*, *ſour Grapes*, *Currants*, *Quinces*, and many ſuch like juices held in the Mouth *coagulate* the Spittle: but if any of them touch the Blood, as by injection into the Veins, they *coagulate* it, and produce *Polypuſes* in the Heart and Pulmonary Artery. Some alſo of the ſame *juices*, when ripe, *attenuate* a little. 2. *Fermented acid Spirits*, eſpecially if their *powers* be very much concentrated, that is, if they are brought to their *higheſt degree of Acidity*; for *ſimple* or *diluted Acids*, as *ſimple Vinegar*, do not *coagulate*, but rather *dilute*. 3. All *ardent fermented Spirits*, brought to that degree of

ſubtilty, as to deſerve the name of *Alcohol*, or to ſet fire to the *Pulvis Pyrius:* and theſe may be obtained from all Vegetables, by the help of Fermentation, firſt leading to *vinoſity*, and then to the nature of *Vinegar*; for if they are diſtilled before they grow *acid*, then there is an *inflammable Spirit* obtained from them, which *coagulates* the Spittle it's ſelf: hence thoſe *Practitioners* greatly err, who recommend theſe *Spirits* in too great a *tenacity* of the humours.

THOSE Foſſils which *coagulate* are, 1. *Vitriolic Salts:* as *Vitriols of Steel*, *Lead*, *Silver*, *Copper*, *Mercury*; alſo *Alum*, and *ſublimate Mercury*, if they are taken in ſo ſmall a quantity, as only to *ſtimulate*, and not diſſolve; thus *Lapis Infernalis* in a ſmaller quantity *coagulates*, but in a greater *diſſolves*. 2. All *acid Spirits* drawn from Foſſils by a violent Fire: as *Spirit of Sulphur*; which if it *opens*, does it only as it *ſtimulates* the Solids, but in this place it is conſidered as immediately *acting* on the Liquids, and *coagulating* them when mixed with them; the ſame is effected alſo by *Spirit of Sal Gem*, *Sea Salt*, *Alum*, *Vitriol*, and *Nitre*; alſo *Aqua Fortis* whether made of *Vitriol* and *Nitre* only, or of *Alum* with the addition of both theſe: but amongſt theſe the greateſt Coagulaters are *Spirit of Nitre* and *Aqua Fortis*.

MOREOVER all theſe exerciſe a *double* power in us; namely, 1. They *act* on the Solids, and *corroborate* them, that is, *ſtimulate* them into contraction; and therefore more reſiſt a greater *diſtenſion*, and conſequently the *action* of the Heart: hence their *mutual motion* is increaſed, and their *action* on our Liquids becomes *greater*; whence follows an *attenuation* of the Liquids, a *diſſipation* of the moſt fluid parts, and thence at laſt a *Coagulum*. 2. Being mixed in a ſufficient quantity with our

Liquids, they immediately *coagulate* them. Hence therefore we ſee, how the ſame Medicine may be *ſolvent* and *coagulating* at the ſame time.

4. To the *ſecond* Claſs of *Coagulaters*, that is, *Abſorbents*, belong the following.

1. All *Earths*, both *burnt* and *unburnt*, that is, *native* and *fat*: as *Chalks* and *Boles*, alſo all *Potters Earths* and *Clays*; which however the more they are *burnt*, and the *finer* they are, the more they abſorb. 2. All *Shells* of Fiſhes reduced to aſhes: as *Conchs*, and eſpecially *Crabs claws*, *Oyſters*, *Corals*, *Mother of Pearl*, *&c.* 3. All *ſolid* and *fluid* parts of Animals *burnt*: as Bones, Horns, Fleſh, Membranes, *&c.* which being reduced to aſhes are *ſtyptic* and coagulate: as *roaſted Liver*, *burnt Blood*, *&c.* and all things that may be reduced to inſipid aſhes. 4. *Calx's* of Metals *burnt* with a ſtrong fire: as *Colcothar of Vitriol*, which being taken into the Mouth *coagulates* the very Spittle; thus alſo *Copperas calcined* with a very ſtrong Fire, if it be applied *warm* to the Blood, makes it as hard as a Stone.

CHAP. VIII.

Of MOVERS.

1. THERE may *two* ſorts of *motion* be conſidered in our Liquids; *one* is the *inteſtine* motion of the particles, which we do not conſider in this place; the *other* is that by which our Fluids are circulated thro' the Veſſels, whilſt *life* remains. The *Movers* therefore, of which we ſpeak in this place, *are thoſe which accelerate the motion of the Liquids thro' the Veſſels.*

2. There are *four* conditions required to the *circulatory motion* of the Fluid: 1. The *force* of the Heart upon a Fluid, as being that on which the principle of *motion* depends: now as that is not continual, but interrupted, there is required to preſerve this motion, 2. The *Contraction* of the Arteries: which being ſuppoſed, there is ſtill required, 3. A *fluidity* of the *matter* to be *tranſmitted*; which is nothing elſe, but an eaſineſs of *ſeparation* of the parts, from each other without any notable reſiſtance: 4. A *laxity* or *freedom* of the Veſſels, that is, the leaſt reſiſtance towards the extremities, ſo that the Veſſels may freely *unfold* and *diſtend* themſelves. Whatſoever therefore increaſes the *force* of the Heart and Arteries, or the *fluidity* of the Liquid, or the *dilatability* of the Veſſels; is alſo a *Mover*; but eſpecially that which increaſes the *force* of the Heart: by the increaſe of the *motion* of the Heart, there is made a greater *ſecretion* of all the humours, and therefore of the Nervous Liquid; which *flowing* more copiouſly into the *muſcular villi* of the Heart, adds *new ſtrength* to it, whence the *circulation* is ſtill more promoted and accelerated.

3. The Claſſes of *Movers* are the *three* which follow.

I. The firſt Claſs contains 1. All *Stimulaters*, which by *affecting* the Nerves, promote a more plentiful *ſecretion* and *flow* of Spirits; whence the Heart obtains a greater *force*: and thus in *languid* and *apoplectic* diſorders, &c. where the circulatory motion flags, we are wont to *irritate* the Nerves, either by *ſtimulating* them with ſomething offenſive, or by plucking out the *Hairs*. 2. All *relaxing Stimulaters*, that is, thoſe which make the Veſſels ſo *dilatable*, as to admit the Liquids eaſily. 3. Whatſoever attenuate the Blood. 4. All that generate *Acrimony* in the Liquids. 5. All *Diluters*, but of theſe five Heads I have ſpoken already in their proper place.

The ſecond Claſs contains whatſoever accelerate the *motion* of the Blood thro' the Veins: amongſt which the principal is the *compreſſion* of the Veins; which may be done *two* ways; 1. By *rubbing* the parts, from the extremities towards the Heart: hither belong *Frictions*, *Baths*, and *warm Fomentations*. (Compare the Chapter *of Solvents*, ſect. 5.) 2. By *moving* the Muſcles very much: which indeed is of much greater ſervice in the *Dropſy*, *hyſteric Paſſion*, *Green-ſickneſs*, *&c.* than moſt *internal* Medicines; for by *increaſing* the reſpiration, the velocity of the Blood is much augmented, the Pulmonary Vein being frequently compreſſed and emptied by the *Air* in the Lungs. Hence alſo *ſneezing*, *ſinging*, *coughing*, and *laughing* are of great ſervice to Leucophlegmatic Perſons.

III. The third Claſs contains thoſe Medicines which remove the *faults* of the Fluids, Now a Liquid may either be *deficient* in *quantity* or *offend* by too much *thickneſs*: and if there be ſo great a *deficiency* of Liquid, as to take away it's *continuity* in the Veſſels, it's motion muſt neceſſarily be ſtopped; for the antecedent part ought always to be *impelled* by the ſubſequent; and we ſuppoſe *this* to be *wanting*. Therefore on this occaſion the *loſt* Liquid ought to be reſtored: and therefore Men of a *hot conſtitution*, as well as thoſe who are emacited with too much *ſweating*, are greatly relieved by *whey*, that is, by repairing the *deficiency* of the loſt Liquid. But now if the Liquid *offends* by it's *thickneſs*, then ſuch as *incide*, *dilute*, and *attenuate*, ought to be adminiſtred.

CHAP.

CHAP. IX.

Of SISTENTS.

SISTENTS are thoſe, which take away, or diminiſh, the cauſes of acceleration juſt now mentioned: as are thoſe which appeaſe the *ſtimulus* of the Nerves, take away the *laxity* of the Veſſels toward the extreme parts, give a *thickneſs* to the Blood, and abſorb the *thinner* Liquids; alſo thoſe which hinder the *motion* of the Muſcles and of Reſpiration: there are ſome alſo, which *ſpecifically* deſtroy the *ſtimulus* of the Nerves, as *Opium*; thus alſo, in intermitting Fevers, the *Peruvian Bark*, &c.

PART III.

OF
MEDICINES
Which act on the SOLIDS *and* FLUIDS *together.*

MEDICINES which *act* on the Solids and Fluids together often obtain *various* names and *different* effects, according as they are applied to this or that part of the Body: thus, for example, the *root* of *Jalap* applied to the Skin acts as a *Veſicatory*; and yet being applied to the inteſtinal Glands, becomes a mere *Hydragogue*; if it be given with *Treacle* and *Opium* it becomes a *Sudorific*, for it is driven to the *inner* parts; if it is mixed with the *yolk* of an *Egg*, and applied *externally* to a wound, it becomes a *Detergent*, and *excites pain*: thus alſo if about the *Fauces* any Veſſel is too open, ſo that the Liquid drops from them, *China* reduced to powder relieves it.

MEDICINES therefore which *exert* their *powers* both on the Solids and Fluids, may be conveniently enough reduced to *two* Claſſes.

THE *firſt* Claſs contains all thoſe which promote the circulation of the Blood, and the Secretions, and thoſe alſo which produce the *contrary* effect, that is, which retard and debilitate the Circulation and Secretions.

BUT the *latter* contains all thoſe which promote Excretions from any part of the Body whatſoever.

The

The Firſt CLASS

Of MEDICINES *which act on the* SOLIDS *and* FLUIDS *together.*

NOTWITHSTANDING that theſe Medicines may *in general* be divided only into two Claſſes, as we have ſeen juſt now; yet as we have before, in the PROLEGOMENA, CHAP. xiii. diſtributed them into five Claſſes (for which conſult the *ſaid chapter*, *page* 89, *& ſeq.*) we ſhall follow the ſame order here alſo.

MOREOVER becauſe, according to the diviſion there laid down, all the Medicines which we have treated of in PART I and II, are to be referred to the *firſt* Claſs, ſo far as they *operate* by combined actions, therefore we ſhall not repeat them at preſent: but becauſe we have referred to this Claſs alſo the Medicines which promote *pecular* Secretions, we will now begin with *it*: but *hereunder* are contained in the firſt place the *Generaters* of *Milk* and *Seed*; of which therefore we will treat now.

CHAP. I.

Of Generaters of Milk.

1. M*ILK*, in *Greek* Γάλα, is the very ſubſtance of the *chyle elaborated* in the Stomach, farther *ſubdued* in the Inteſtines, *abſorbed* by the *Lacteal*

Veins

Veins, *carried* thro' the Thoracic Duct into the Subclavian Vein, and there *mixed* with the Blood, hence it is *carried* to the right Ventricle of the Heart, and then to the Lungs, and being there *comminuted* and more accurately *mixed* with the Blood, it comes to the left Ventricle of the Heart, and is thence *diſtributed* thro' the *Aorta* and it's Branches; which in four or five hours or more, after a plentiful *meal*, is found to *ſwim* in great quantity, on the Blood taken out of any Vein or Artery, as LOWER (*a*) teſtifies; and then agrees in every thing with Milk: but after that time, by a continued *circulation* in the Body, it is gradually *changed* into Blood: but part of this *lacteſcent Chyle*, being ſeparated from the reſt, comes to the Breaſts, and there obtains it's proper name of *Milk*; which therefore is not different from the other *Chyle*, but ſometimes becomes more *ropy*, if the Woman endures *thirst*.

2. NOW the Medicines which produce this Liquid are called *Galactophora*, or *Generaters of Milk*: That *Milk* is immediately ſecreted from the Chyle, is manifeſt from this, that if a Nurſe drinks any thing *coloured* or *odorous* upon an empty Stomach, her *Milk* will in a ſhort time be infected with the very ſame colour and ſmell: (*b*) moreover if a Nurſe

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(*a*) See LOWER *Tract. de Corde, cap.* V. *p.* 238.

(*b*) Hence any *Medicine* given to the Nurſe, eſpecially if it be pretty ſtrong, is found by *experience* to tend towards her *Breaſts*, and affect her *Milk*. Alſo if a Child be put to the Breaſts as ſoon as the Nurſe has taken a *purge*, and continues ſucking till they are emptied, it will be *purged*, and the Nurſe will not be affected by it; as we find by experience, and as HIPPOCRATES alſo long ago affirmed. *Lib.* vi. *Epidem. Sect.* 5. *verſ.* 51. *Edit. Lind.* where he ſays as follows. Γυνὴ αἲξ, ἐλατήριον (or perhaps as ſome read it, ἐλλέβορον) ἢ σικῦον ἄγριον βεβρωκυῖαι, καὶ παιδίοισι κάθαρσις: that is, *If a Woman that ſuckles takes Hellebore or Elaterium, the Child will be*

Nurſe abſtains from *meat* and *drink* twelve hours, her *Milk* will be rendered ſo *ſerous* or *urinous*, thro' defect of new *Chyle*, that the Child will quite nauſeate it: the ſame thing happens in the *Fevers* of Nurſes.

3. HENCE we find what things produce *Milk* in our Body; namely, 1. All that produce *plenty* of *Chyle.* The aliments of this kind are ſuch as in their nature moſt reſemble Chyle: as (α) *Milk* ſweet and freſh; eſpecially if it be improved with a little *Salt* and *Sugar*, for it affords the beſt matter of all for *Chyle*: for it has often happened, eſpecially among thoſe that live high, that Mothers who have not been able to *ſuckle* their Children, for want of *Milk*, occaſioned by eating too much *fleſh*, have become good Nurſes to their Children by the *preſcription* of a *Milk* diet; which has been confirmed by frequent experience. (β) *Cream* ſweat and freſh; eſpecially if the *Milk* of the Nurſes be too watry. (γ) All thick *Ptiſans*, made of *Barley* or rather of *Oatmeal* boiled with *Milk*. (δ) All ſorts of *Caudle*, whether made with *Wine* or *Ale*. (ε) *Rice gruels* with *Piſtachios*, and ſuch like *farinacious ſubſtances*, or *Emulſions* made of the ſame. (ζ) *Fleſh Broths* not made too thick; which almoſt immediately go to the Breaſts. (η) *New laid Eggs* prepared after various manners. (ϑ) *New Ale* not

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be purged. See the explanation of this *ſentence* in PROSP. MARTIANUS, the beſt Interpreter of HIPPOCRATES *Commentar. page* 353, *Edit. Rom.* who alſo in another place, namely in *Comment. in Libr. de Natura Pueri, page* 43, relates this extraordinary *Story*, which is very much to our purpoſe; "A certain Woman having taken a *purging* Medicine, and put "a Girl of a Year old to her Breaſt, the Child was *purged* ſo "vehemently, that it was in danger of loſing it's life. whereas "the Mother had not ſo much as *one* motion: an evident ſign, "that the Medicine was immediately drawn to the Breaſts by "the power of *ſuction, &c.*"

not long fermented, thick and ſweet. For from all theſe *Milk* is ſoon ſecreted, which may be properly taken by the Child after a quarter of an hour. 2. All things that derive the generated *Chyle* into the Breaſts; and theſe are all ſuch as promote *chylification:* as (α) *Stomachics*, which increaſe the *ſtrength* of the Stomach ſo that it may *contract* it's ſelf effectually to expel the *Liquid:* hence we muſt obſerve whether the Nurſe has a *depraved* Stomach. (β) *Splanchnichs*; which excite the *flux* of the Bile, pancreatic Juice, and that of the Inteſtines. (γ) All motions of the Muſcles; as *walking*, *domeſtic labour*, *&c.* all theſe, by promoting *chylification*, derive plenty of *Milk* to the Breaſts. 3. Whatſoever excite the *efflux* or *drawing* of the *Milk* out of the *Breaſts:* for the more they are drawn, the more is derived into them. Now there are ſome things which promote the *Milk*, by drawing it out; ſuch are all thoſe which diminiſh the *reſiſtance* of the Lactiferous Veſſels: as (α) The application of *Glaſſes.* (β) *Emollient Fomentations* often applied. (γ) *Frictions.* (δ) *Suctions.* All which, if Women were to make uſe of them, would be of uſe to tender Infants, which are not able to draw the *Milk* out themſelves by *ſucking:* thus alſo *young Puppies* may be advantageouſly applied to the *Nipple* rubbed over with *Butter.* But *hot* Medicines, which are uſually thought to belong to this Claſs, act only by *ſtimulating*, and therefore are not properly to be treated of here.

COR. FROM what has been ſaid it appears, that thoſe Nurſes are the beſt, who have a *lax fleſh*; for they generate as laudable *Chyle*, as thoſe which are *ſtronger*, and beſides yield it in greater plenty.

CHAP. II.

Of Spermatopœa or Generaters of Seed.

THERE are *three* ſorts of Liquid required to the generation of *Seed*; 1. The Liquid of the *proſtatæ*. 2. That of the *Veſiculæ Seminales*. 3. That of the Teſticles; which alone is *prolific*, as appears by Eunuchs: wherefore a Medicine generating *Seed* is that which promotes the *elaboration* of this Liquid in the Teſticles: ſuch are,

1. All that increaſe a mild *Chyle*, and conſequently increaſe *Milk* and *Blood:* hence alſo Animals that feed moſt on Milk, are the moſt *ſalacious*.

2. All *relaxing* Medicines, and ſuch as take away the *reſiſtance* in the Teſticles: as *Fomentations* and *warm Baths*; all *oily* Medicines, as *Oil of Rue*, &c. and *preparations* in form of *Balſams* or *Cataplaſms* applied to the *Scrotum*. The following are thought to be *ſpecifically Generaters of Seed:* various *preparations* of *Southernwood*, *Marum Syriacum*, *Birth-wort*, *Calaminth*, *Hedge-muſtard*, *Eryngo*, *water and garden Creſſes*, *Dittany*, *Lovage*, *Cretic origany*, whence the Men are ſo *ſalacious* in *Crete*, *Cat-mint*, *Parſley*, *Savin*, *Mother of Thyme*, *Thyme*. Theſe being *externally* applied, draw the Liquid that way.

3. Whatsoever being taken *inwardly* greatly ſtimulate the *nervous Liquid*, and are wont to cauſe *Priapiſms:* ſuch as *Garlic*, *Onions*, *Leaks*; alſo all that are enumerated in the *ſecond* Claſs; thus alſo all *aromatic Gums*, as *Myrrh*, *Aloes*, *Galbanum*, *Sagapenum*, *Gum Ammoniac*, *Bdellium*, *Elemi*, *Ta-*

camahacca; alſo the *Balſams* of *Peru*, *Tolu*, *Mecha*, *Capivi*, *Opobalſamum*; alſo all *provocative aliments*, which being taken in too large a quantity cauſe an *erection*. The *ſeminific* power of all theſe appears from this; that if they are given to Men who are recovering from a *Gonorrhæa* they excite a dropping of *Seed*.

To this Claſs alſo are to be referred all *Salts*, except *Vitriol* and *Nitre*, as *Borax*, *Alum*, *Sea-ſalt*; all *volatile Salts*, and eſpecially the *oily*; alſo all *Soaps* and *Diuretics*, except only Water, alſo the *Oils* of Animals, as *Caſtor*; *aromatic Oils* of Vegetables. But it muſt be obſerved, that theſe do not properly generate *Seed*, but only promote the Secretion of it, by ſtimulating the Nerves: hence they are not fit to be given to old Men, in whom the *Seed* and Nervous humour is deficient. To all theſe may be added *Laſcivious thoughts*, whence frequently ariſe nocturnal pollutions, *&c.*

4. *SPECIFICS* recommended by the Ancients: ſuch as *Dill*, *Fennel*, *Rocket*, *Chiches*, *Satyrion*, which all operate after the manner juſt now mentioned; as alſo the *Teſticles* of *ſalacious* Animals, thoſe of *Goats*, *Horſes*, *Cocks*, and the *Brains* of *Sparrows* are commended by the Ancients; but theſe are doubtful, and perhaps vain.

The Second CLASS.

Of MEDICINES *which promote the Excretions.*

CHAP. I.

Of Diſchargers of Phlegm.

1. BY *Phlegm* is meant that tough and whitiſh *pituitous* ſubſtance, which is ſeparated in the *pituitary* Membrane, that *inveſts* the two great *Sinuſes* of the *Os Frontis*, the Cheek Bones, the *Os Cribiforme*, the *Criſta Calli*, the *Sella Turcica*, all the little Bones of the Noſtrils, and the Noſtrils themſelves; concerning which ſee SCHNEIDER's *Tractatus de Catarrhis*. But it is to be obſerved, that there is no part of the Body, in which the Blood Veſſels are more *naked*, or the Nerves leſs *covered*, than in this Membrane; nay and from the very ſituation of this Membrane it plainly appears, that the power of *Diſchargers of Phlegm* extends it's ſelf into the *cavities* of the *Os Frontis* on every ſide: hence theſe Medicines were ſaid by the Ancients to *purge the Brain*, as if they related to the Brain it's ſelf; but SCHNEIDER has demonſtrated, that nothing flows from the Brain it's ſelf to the *Glands* of the ſaid Membrane, but that there is a certain ſubſtance ſecreted in them from the *arterial* Blood, before it is carried to the

Brain; whence it becomes more pure and free from droſs: and in reality when this ſubſtance is firſt ſecreted, it is *thin* and *ichorous*; but in a ſhort time, by the power of heat, it is inſpiſſated into a *thick* matter called *mucus.*

2. THE Medicines therefore, which belong to this Claſs, are all *Detergents*, *Diluters* and *Stimulaters*; as *Waters*, *Salts*, *Soaps*, *Spirits*, *Aromatics*, and *Aromatic Decoctions*, whether made with *Water*, *Wine*, or *Spirit of Wine*: and theſe are applied, 1. In form of an *Errhine*, which draws out the matter by the Noſtrils; and this is of moſt ſervice, when any morbid matter ſticks in the Noſtrils, from a *Canker*, or the *Veneral Diſeaſe*: 2. In form of a *Gargariſm*, which draw the matter out of the *Fauces*; and this is always *Liquid*; 3. In form of a *Maſticatory*, which brings out the *Phlegm* by the Mouth; and generally conſiſts of a mixture of Wax and Aromatics: 4. In form of a *Collutory*, whether it is performed by means of a *Syringe*, a *Linnen-cloth*, or any other way: 5. In form of a *Linctus*, which being ſwallowed ſlowly *ſtimulates* the *Fauces*; and is of ſervice on that account: 6. In form of *ſmoak*, which is taken from all *aromatic* Herbs, by means of a pipe, or any other artifice. Now as the *firſt* ſpecies *purges* only by the Noſtrils, and the other *five* by the Mouth, all *Diſchargers of Phlegm* may be conveniently enough reduced to *Ptarmics*, or *Errhines*, and *Sialogogues*, or *Movers of Spittle.*

3. *PTARMICS*, *Errhines*, or *Sternutatories* are thoſe which by provoking one to *ſneeze*, draw the *Mucus* from the Glands of the *Membrana* SCHNEIDERIANA. Now *ſneezing* is performed after the following manner; firſt the Thorax is greatly dilated, which cauſes the Air to enter the Lungs in a great quantity; which after ſometime

being rarified by the heat, is driven from thence with great force thro' the ſtraits of the Noſtrils, and is there divided into ſix parts formed by the Bones in the Noſe; and whilſt it is driven thro' thoſe ſtraits, it ruſhes violently on the Membrane, and moves the *Mucus* contained in the Glands, and carries it away with it: Theſe therefore are the effects of *ſneezing*. 1. The clearing of all the *foramina* and caverns of the Noſtrils. 2. The clearing alſo of the Lungs. 3. A very ſtrong ſhaking of the Body. Hence it is of the greateſt ſervice in thoſe *diſeaſes*, where the *nervous Liquids* ought to be moved: as in the Apoplexy, ſlow Scurvy, and difficult labour, where the ſtrength of the *Mother* is deficient. *Sneezing* alſo, if it continues too long, brings on Convulſions and Death it's ſelf; whence ariſes the cuſtom of ſaluting thoſe who *ſneeze*.

4. THERE are two Claſſes of Errhines. The *firſt* contains all thoſe which can *vellicate* the *Membrana* SCHNEIDERIANA mechanically: as *Duſt*, *Feathers*, *Animalcules*, or *Blood* accumulated there, either on account of obſtruction or inflammation; whence it happens, that at the beginning of a heavineſs, the *Mucus* of the Noſtrils is wont to come out in great plenty. The *latter* contains all *thin*, *volatile Acrids*: each of which, the more *acrid* it is, operatees the more *violently*; thus *Hyſſop* excites a gentle *ſneezing*, *ſavory* a little ſtronger, *Pepper* a ſtill greater, *Euphorbium* a much greater, *corroſive ſublimate* a moſt vehement one, which keeps Perſons in the act of *ſneezing* for ſeveral hours, tho' it be taken in a very ſmall quantity.

5. SIALOGOGUES or *Salivaters* are Medicines, which move the *Saliva* or Spittle. There are *many* Glands which ſupply the Spittle. 1. The *Glandulæ ſalivales ſtenonianæ*, or *Parotids*. 2. The WHARTONIANÆ,

ſituated at the greater angle of the lower jaw. 3. The BARTHOLINIANÆ placed under the very Tongue. 4. The SCHNEIDERIANÆ, or thoſe of the Palate; hither belong alſo thoſe of the Tonſils and Uvula. 5. The *Lingual* Glands of MALPIGHIUS. 6. The NUCKIANÆ *Oculares*, which are placed by the Eye, and have their *Duct* opening into the Mouth (*a*). But the *Sialogogues* are reduced to three Claſſes.

THE *firſt* contains thoſe, which act on the Glands juſt mentioned: ſuch as, 1. *Fomentation, Friction*, and *Suction* either *internal* or *external* of theſe parts; hence Cataplaſms applied to the *Parotides*, and the *ſmoaking of Tobacco* make the Mouth moiſt. 2. All the *Diſchargers of Phlegm* juſt mentioned. But here it muſt be diligently obſerved, that theſe Medicines never cure diſeaſes by *ſalivation*, as many think, for it is not *ſalivation* that cures the Venereal Diſeaſe, but *ſalivation* follows, becauſe the *diſeaſe* begins to be cured.

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(*a*) See a more accurate deſcription of all theſe Glands in our celebrated AUTHOR's *Inſtitut. Med. Cap. de Salivâ, paragr.* 65. alſo in NUCK's *Sialograph. pag.* 8 to 23. Moreover in this place it is to be noted, that the *Glandulæ Oculares* NUCKIANÆ may be expunged from that Catalogue as being found indeed in Dogs, but being always wanting in Men. But to the ſalival Glands here *enumerated*, a new *Glandulous Expanſion* alſo with it's *Duct*, was ſome years ago added by ABRAH. VATER profeſſor of Phyſic at *Wittemberg*; which he affirmed that he had diſcovered, by means of *injection*, in the *Tongue* of a Girl; and in the *Programma*, which he publiſhed in 1720, he called it *A new Salival Duct, and a principal excretory of a remarkable Gland in the Tongue, ſituated at the ſides of the Tongue, and under it, expanded alſo over the Root of the Tongue, Epiglottis, about the Glottis, upon the Arytænoides even within the Oeſophagus.* But the *foramen* of this Gland has been diſcovered and delineated by COLLINS, *Anatom. Tab.* 2. and by MORGAGNI *Adverſar. Anatom.* 1. *Sect.* 8. *Tab.* 1. and by HEISTER, *Compend. Anat. Tab.* 4. *Fig.* 20.

The *ſecond* Claſs contains all thoſe which derive the *moiſture* into the Mouth, by intercepting the flux of it into the other parts of the Body: for it is obſerved, that if ſome Bowels are *obſtructed*, as the Liver, Spleen, Pancreas, Kidnies, or Inteſtinal Ducts, then the Mouth is always *moiſt*; whence Hypochondriacal and Hyſterical Perſons *ſpit* much: and therefore whatſoever hinders the Secretion of the *Lymph* in thoſe places, is to be accounted a *Sialogogue*, but whether this is of ſervice or diſſervice, is not here inquired.

The *third* contains thoſe which diſſolve the Maſs of Blood, and derive a great plenty of it being ſo *diſſolved* into the Mouth: ſuch as, 1. *Antimony*, ſo far fixed by Nitre, as not to be able to cauſe either *Vomiting* or *Purging*, but only a *Nauſea*; for hence it derives a plenty of Spittle into the Mouth: for it is manifeſt, that all *Vomitories*, before they move the Stomach to contraction, produce a *Nauſea*, which however is always accompanied by an unuſal *moiſtneſs* of the *Fauces*. 2. *Mercury*, which may be uſed after various manners; (α) Crude *Mercury* applied to the Body excites a *Salivation*: and it may be applied (1) in form of a *Liniment*, as in the *Unguentum Neapolitanum*: (2) In form of *Smoak*; for if twelve grains of *Quickſilver* be laid on the Fire, they will emit a *Smoak*, which, if it be received up the Noſtrils, will excite a *Salivation* in two or three days: (3) It may be taken *internally*, as in the *Pilulæ Barbaroſſæ*, to excite a *Salivation*, but only in a ſmall quantity, for otherwiſe it will ſeek a paſſage thro' the *Anus*: (4) If it be much *handled* for a great while, a *Salivation* may ariſe, as we find by experience; for Goldſmiths, who make much uſe of it, often fall into a Spitting. (β) *Mercury* united with *Salts* by Sublimation produces a Salivation; (1) If it be taken inwardly in a ſmall doſe, (2) If it be externally applied to Wounds or Ulcers; (3) If it be ſnuffed up the Noſtrils.

From what has been ſaid therefore it appears, that after what manner ſoever *Mercury* is applied to the Body, it will excite a Salivation; and produce the ſame effect in us, after what manner ſoever it is prepared, unleſs it be taken with ſomething elſe, which may hinder it's *diſſolution* in the Stomach and Inteſtines, and conſequently it's *paſſage* thro' the Lacteal Veſſels: for then it will not cauſe a Spitting, but paſs out of the Body thro' the *Anus*; as may be obſerved in *Cinnabar*, and *Æthiops Mineral*, which conſiſt of *Sulphur* and *Mercury* united and mixed. Moreover *Mercury* is the moſt ponderous of all *Liquids*: for it is the moſt divided and diviſible; as appears by it's *penetrating power*, which paſſes thro' all Bodies except *Glaſs*: each of it's particles alſo, how *minute* ſoever, retains it's ſpecific Gravity, which is greater than that of any other Fluid, and proportional to the *weight* of it's whole bulk, as is demonſtrated by Newton. Hence if *Mercury* is mixed with other Liquids, and a *motion* is impreſſed on both of them from the ſame cauſe, the *Mercury* will be carried much more *ſwiftly*, and will keep it's *motion longer* than the other Liquids: wherefore it's particles impinging on the leſs moved particles of the *Fluids*, will penetrate, divide and comminute them by a certain *force* ariſing from the exceſs of it's *velocity*, and will impreſs a greate *motion* upon them. But tho' this action of *Mercur* on other *Fluids* depends on it's *ſolidity*, as the onl cauſe, yet it may be *increaſed*, by reducing it int *Minutiæ*: for then every particle will receive proportional power of *acting* from the *increaſe* o it's ſurface. But *Mercury* being received into ou Body does not act on the Fluids, except in th

ſmalle

ſmalleſt Veſſels; for ſo long as it is moved in the *greater* Veſſels, it runs into *drops*, and is not there *internally* mixed with our Liquids; but being brought into the *ſmalleſt* Veſſels, it is divided into *Minutiæ*, becauſe of the ſtraitneſs of the paſſages, and is perfectly mixed with our Liquids. Whence it is manifeſt, that it does not *act immediately* on the Blood, but on the Lymph, as being contained in the *ſmalleſt* Veſſels. Hence the reaſon may appear, why in *obſtructed* Bodies, as in thoſe which labour under the Venereal Diſeaſe, Dropſy, Scurvy, *&c.* it operates with *greater effect*, than where all the Veſſels are *open*: of which I lately ſaw a notable *example* in a certain Man, who *twice* had the Venereal Diſeaſe, and had been as often cured; but when he fell a *third time* into it, the *cure* was attempted with *aperient Decoctions*, becauſe of the *Caries* of the Bones; and theſe failing of ſucceſs, *Mercury* was applied, which however did not excite a *Salivation*: but *half a year* afterwards, his Body, being obſtructed by a *Leucophlegmatia*, preſently felt the power of *Mercury*, tho' applied in a very ſmall quantity; whence he fell into a moſt violent *Salivation*.

FROM what has been ſaid may be gathered, that the *power* of *Mercury* taken into our Bodies conſiſts in dividing and diſſolving the *Moleculæ* of our Fluids, that are too much compacted, and conſequently in taking away *Obſtructions*: for by whatſoever *mechaniſm* our Liquids ſuffer attrition and comminution, and are broken ſo as to be reduced into very *minute* parts, by the ſame they are rendred fit and ready for an eaſy and copious *Flux*, into the *lateral* Lymphatic Veſſels, and therefore for *Salivation*: but that the effect of *Mercury* is ſuch as has been already deſcribed, is manifeſt from hence, that if the Spittle or Urine be divided into *minute* parts without *attrition*, or the *heat* of the Sun or Fire, it will emit the ſame *ſtink* as Spittle moved by *Mercury*. The *force* alſo of *Mercury* is much promoted, if any *Stimulus* be added to it, as a *Cauſtic* or any *Acid*; for then it produces horrid *Salivations* and intolerable Purgings. Laſtly, it muſt be obſerved, that ſome without reaſon aſſert that the parts of *Mercury* adhere to the ſides of the Veſſels, whereas it is a very moveable Body.

CHAP. II.

Of EXPECTORANTS.

1. *EXPECTORANTS are thoſe which expel the morbid matter, ſticking in the Bronchia, thro' the Larynx or Windpipe.* To perform this, four things are required; 1. That the matter there contained be rendred *moveable* and *penetrable*, ſo that it's moſt fluid parts may not be diſſipated, and the matter that remains become viſcid, tenacious, and inextricable: hence therefore thoſe things which are *hot* and *ſtimulating* are *injurious*. 2. That the *paſſages* be opened, deterged, and lubricated. 3. That the matter be provoked to *excretion*: which is beſt performed by *coughing*; to which a *Stimulus* and ſufficient ſtrength are required. 4. That the ſtuffed Veſſels may be at reſt, in order to Relaxation; for if they were continually irritated, the *moiſture* would be thrown out perpetually from the *Glands* of the *Aſpera Arteria*, with a ſenſe of pain.

2. *EXPECTORATING* Medicines therefore, ſo far as they have relation to theſe *four Requiſites*, may be divided into *four* Claſſes.

The *firſt* contains all *Stimulaters*, that are *aromatic* and *bitter*, and at the ſame time *oily* and *mild*: ſuch are *Wormwood*, *Carduus benedictus*, *Hore-hound*, *Hyſſop*, *Marjoram*, *Elecampane*, *Penny-royal*, *Valerian*, *&c.* hither alſo belong *Sulphurs* mixed with *Alkalies*; all fixed *ſaponaceous Bodies*, as *Venice Soap* in *Pills*, or taken with *Milk*; all *oily volatile Soaps*, and *volatile* and *fixed Salts*; and in general, all that are *ſtimulating* and *diluting* at the ſame time.

The *ſecond* contains *Aperitives* and *Detergents*; as the *mild Oils* of *Poppy*, *Almonds*, *Olives*, *&c.* alſo Honey, which opens, cuts, attenuates, deterges, and lubricates: hither alſo belong *Emulſions*, *Soaps*, *Yolks of Eggs* with *Oils*, and *Sugar*, at leaſt in a ſmall doſe; for tho' it is condemned by ſome, yet it is certainly a *rectified Salt*, and not ſo pernicious to our *natural Balſam*, as ſome imagine: hither alſo belongs *Manna*, which is an excellent Lubricater; and *Balſams* alſo, as *Turpentine*, *Balſam* of *Peru* and *Mecha*, *Gum Elemi*, *&c.* which act by an aromatic *Stimulus*, and lubricating Oil: laſtly, hither alſo belong all *relaxing* and *emolient Decoctions*.

The *third* Claſs contains thoſe which excite a *Cough*; as Wine, Vinegar, acrid *Spirits*, and *Errhines*: hence appears the reaſon, why Hippocrates gave either *Wine* or *Vinegar* or *Oxymel* mixed with *Pepper*, in a *Vomica*, when the *critical* day was approaching.

The *fourth* Claſs includes *Demulcents*, *Anodynes* and *Narcotics*; of which the chief is *Opium*: for when the *Aſpera Arteria* is once excoriated, it is eaſily moved into a violent *Cough*, and *Spaſms*, unleſs they be reſtrained by *Opium*.

CHAP. III.

Of Purgers by Stool.

1. PURGERS *by Stool are thoſe Medicines, which being applied either externally or internally to a living Body, evacuate the morbid matter by the Inteſtinum Rectum.* The Phyſicians in all times have called thoſe *Purging* Medicines which drive out the *impure* matter thro' the laſt Inteſtine, by *impure* they underſtood whatſoever was hurtful to *Nature*; and by *Nature* all that is neceſſary to Life and Health; that is, a good Conſtitution of the *vital*, *natural* and *animal Functions*: therefore what they called the *impure* matter, was whatſoever injures theſe *Functions.*

2. *PURGATION is an Excretion by the Anus of all thoſe things which can flow from any part of the Body thro' the Inteſtines.* It muſt be conſidered therefore, 1. Of what ſorts and of how many kinds the Matter is, that is found in the Inteſtines. 2. From what places it comes. 3. Of how many ſorts it's nature is. 4. In what plenty it may flow to the Inteſtines from the other parts of the Body. Whence we ſhall ſee, that almoſt the whole Body may be purged by the Inteſtines.

3. THE Claſſes of thoſe things which may be *contained* in the Inteſtines, and *purged* thence, are the ſeven following.

I. THE *firſt* Claſs includes all thoſe which are *ſwallowed down*: ſuch are, 1. The *Air*; which *mixes* it's ſelf with the *Spittle*, the *Liquor* of the Gullet, and eſpecially with the *Mucus* of the Palate, which inviſcates it: but that it is mixed with theſe, we find from their *froth*, and the ſame is ſhewn by the *Air-pump*; and that it is *ſwallowed down*, appears alſo from the *gripings*, which are often excited by it in Inteſtines. 2. All *Spittle*, *Mucus*, and other *humours* ſecreted from the *Noſtrils*, *Fauces*, *Palate*, and *Membrana* SCHNEIDERIANA, *&c.* of which there is ſuch great plenty, that ſometimes they cauſe a *purging*; as in the *Diarrhœa Catarrhalis*, in which caſe they ſometimes flow to the quantity of ſome pounds, in twenty four hours. 3. All kinds of Meat and Drink.

II. THE *ſecond* contains *all* the *reliquiæ* of Meat and Drink, for there is no Drink ſwallowed, except perhaps the pureſt *Water*, but it leaves ſome *Fæces*, as appears in Infants, that live entirely upon *Milk*, and in ſick Perſons who take nothing but *Broths*, and in ſome Perſons who drink only *Spirit of Wine*: for the *laſt Solids* of all Things, as appears from Chemiſtry, are ſcarce *ſeparable*; hence they cannot be reduced by the Bowels into ſuch *Minutiæ*, as to be able to enter the *Lacteal Veſſels*; theſe particles therefore being heaped together in the Inteſtines conſtitute *dung*: beſides *Fæces* are generated from the *fluid* parts of what we take in; as the *force* of the Bowels cannot ſo ſubdue what is taken in, as to compel the *Solids* to part with their whole Liquid, or to ſubdue and divide the Liquid ſo, that the whole of it may be received into the Lacteals. Hence alſo that PROBLEM is ſolved, why *two* Men uſing the ſame Food, ſometimes differ ſo much, as to their *evacuations by ſtool*; that *one* has an *evacuation* every day, and the other but once in two days; tho' both of them ſeem to be in health, and really are ſo.

III. THE *third* contains *both* ſorts of Bile, the *Hepatic* and the *Cyſtic*. Theſe continually flow into the Inteſtines, eſpecially the *Hepatic*, for the *Cyſtic* cannot always flow becauſe of the ſituation and inactivity of it's receptacle, unleſs it be preſſed by a full Stomach, or a ſtronger motion of the Viſcera. And this continual flowing will be eaſily underſtood by any one, who does but conſider that the Excrements are always *yellow*, except in the Jaundice; for then they grow *white*, becauſe of the obſtruction of the *Ducts* of the Bile: but how ſo great a quantity can be *excreted* in twenty four hours, as ſometimes to amount to three pounds, can appear only from the following conſiderations. 1. The greater the *velocity* is of a Liquid driven to a Gland, the greater alſo is the *ſecretion*. 2. As the *bulk* of one Gland is to the *bulk* of another, ſo the reſt being equal, is the *ſecretion* alſo: but how great the Hepatic Gland is, where the Bile is ſecreted, may be ſeen in GLISSON's *Tract. de Hepate*, and in WHARTON *de Glandulis*. Whence we may gather, that the *ſecretion* of the Liver is to the *ſecretion* of the Parotid, as 3 to 1. 3. The *Out-let* of the Liver is large and open. 4. There is nothing to hinder this *Out-let*.

IV. THE *fourth* contains the *Pancreatic Juice*, which very much reſembles the Spittle in tenacity, taſte, ſmell, *&c.* The Pancreas alſo, which is the Gland that *ſecretes* it, differs only in bigneſs from the *ſalival* Glands: for this Gland has a pretty large *Out-let*; whence it manifeſtly lets down a great plenty of it's Liquid into the Inteſtines; and thus, a compariſon being made between this Gland and the *Salival*, which, in their natural ſtate, ſeparate the Spittle to the quantity of twelve *ounces* in twenty four hours, and if ſtimulated by *Mercury*, *two pounds*: alſo a compariſon being made between the Carotid and Cœliac Arteries, of which the latter is to the former as 2 to 1, which proportion the *pancreatic* Duct bears to the *ſalival* Glands; it may be gathered, that the Pancreas, in it's natural ſtate, emits it's *Juice* to the quantity of twenty ſeven *ounces* in the ſpace of twenty four hours; but, if ſtimulated, *four pounds*. Now the *ſecretion* of a Gland may be increaſed *three* ways: 1. When the magnitude of the Gland is increaſed; for which ſee WHARTON. 2. When there is a greater proclivity in the Liquid towards *ſecretion*. 3. When the reſiſtance in the Cavity of a Gland is diminiſhed by the continual ſqueezing out of the Liquid; whence follows a more plentiful *influx* of the Liquid into it, as appears in the Breaſts of *ſuckling* Women. Hence a reaſon may eaſily be given, why ſo great a quantity of Liquids is ſometimes *excreted* by the Inteſtines in a *Diarrhoea*; becauſe, amongſt the reſt, the *Pancreatic Juice*, which in it's *ſound* ſtate returns into the Blood by the Lacteal Veſſels and Meſeraic Veins, muſt neceſſarily be thrown off by the *Anus*, when thoſe Canals are *obſtructed*.

V. THE *fifth* contains the *Juice* of the Inteſtinal Glands: the continuity of which thro' the whole ſeries of the Inteſtines was demonſtrated by PEYERUS; and what a quantity of them there is, may eaſily be conceived from the *length* of the Inteſtines, which at leaſt *ſix times* exceeds the height of the Man.

VI. THE *ſixth* contains all that are *preternaturally* in the Inteſtines; which are either *fluid* or *ſolid*. The *preternatural Fluids* in the Inteſtines are theſe: 1. All *Pus*, which is always the effect of an Inflammation: now this is a *ſtagnation* of the Arterial Blood in the *ſmalleſt capillary* Veſſels, the Blood preſſing behind; the effect of which is a *contrition* of the *ſmalleſt* Veſſels, and a *change* of the *red* Matter, and of the Veſſels themſelves into a *white* Matter called *Pus*: now that *Pus* of which I am ſpeaking may be generated in the Spleen, Liver, Pancreas, Inteſtines, and other parts. Hence we may anſwer this *queſtion*, why ſo great a quantity of *Pus* is dejected, and whence? for it may proceed from the Spleen thro' the Epiploic Veſſels leading to the Liver, whence it may be carried thro' the *corroded hepatic* Duct to the Inteſtines, of which ſort of *Pus* HIPPOCRATES wrote; or from the Liver or Pancreas thro' the *proper* Ducts; or laſtly from the Inteſtines themſelves. Hence alſo is ſolved that moſt famous PROBLEM, how an *Empyema* may be diſcharged by ſtool? namely, becauſe the *Pus*, lying on the Diaphragm, affects the neighbouring places, eats thro' and perforates the Diaphragm, and then corrodes and enters the Liver or the *Colon*. 2. The Blood which often flows out in great quantity, and that many times after *Purges* ill applied, and in a Dyſentery, may proceed from various *Out-lets*, *two* of which are principally to be noted; (α) the *common* Duct of the Liver, which receives five branches from the Liver, and one from the Gall Bladder: if therefore the ſtructure of the Liver is ſo injured internally, as to have a *real wound*, and if that wound gapes in any of the *Biliary* Ducts, then the Blood will flow in great quantity into the Inteſtines, and thence ſometimes a Dyſentery will proceed: (β) the *Pancreatic* Duct, thro' which the texture of the Pancreas being injured, the Blood may be *excreted*; and this often happens upon a *Cathartic* being adminiſtred to one who has a *ſchirrous* Pancreas; for the Circulation is increaſed by the *Cathartic*, and thence the Veſſels ſituated near the *Schirrus* are greatly preſſed, and at laſt burſten; whence dreadful *Hæmorrhages* proceed, as is well known to the Surgeons. Beſide theſe *two* Ducts of the Inteſtines, which ſupply Blood to the *Cavity*, there are others alſo ſometimes, thro' which the Blood may flow into the Inteſtines; as (γ) the Gullet and Stomach being injured: (δ) the Spleen it's ſelf; whence, if it becomes *ſchirrous* and is *inflamed*, after three or four days, Blood is either vomited up or thrown down by ſtool; which indeed was the *opinion* of the ancients, but that Blood paſſes from the Spleen thro' the Liver. Moreover *grumous* Blood coming from the Stomach is a ſign of an *old Ulcer*, eſpecially if thoſe *Grumes* have a convex ſurface on one ſide, which ariſes from the figure of the Stomach: for the Stomach can retain *Liquids* and *Solids* a long time, as appears from *food* ſwallowed in too large a quantity, which are *putrified* after twelve hours. 3. *Ichor* may proceed from a Rupture of the Lymphatic Veſſels; for it is manifeſt from *Anatomy*, that theſe Veſſels diſperſe their branches into a *conical* form; whence Inflammations may ariſe in them, and tho' not *red*, yet with *pain*; but the *finer* part of the ſtagnating Lymph may eaſily paſs thro' whilſt the *thicker* becomes *acrid* by ſtagnating, and obtains the name of *Ichor*, which is the cauſe of *Pimples* and *Scabs*. Hence it appears that a pretty large quantity of *Ichor*, may be carried down from the great quantity of Lymphatic Veſſels in the Abdomen. 4. The Lymph it's ſelf is extravaſated from wounds inflicted on the Lymphatic Veſſels.

THE *preternatural Solids* contained in the Inteſtines are, 1. *Fats* cut like Lard, which proceed from ſtuffed Aliments, and concreted by a mucous Glue. 2. *Filaments*, *Caruncles*, and as it were *ſmall glandules* of the inner Coat of the Inteſtines; for ſuch looſe Fibres ariſe from the inner coat of the Inteſtines, being eaten, looſened, and abraded by *acrid* and *venemous* particles. 3. It is to be obſerved, that all our Veſſels, which are not yet made cartilaginous, have an *indeterminate* dimenſion; as we ſee in *Varices*, *Aneuriſms*, &c. and therefore, if there is a ſufficient cauſe, the Hepatic, Pancreatic and other Ducts may be exceedingly *dilated*: hence therefore, if any thing ſticks in the Bowels, from which thoſe Ducts proceed, which has remained there after a *Gangrene*, or *Ulcer*, it may be carried thro' them to the Inteſtines: for example, if the Liver be gangrened, it's *diſſolved* parts may paſs thro' the Hepatic Duct being *dilated*; but that the Liver may be inflamed, and then that this Inflammation may turn to an *Impoſthume* or *Gangrene*, is teſtified by FORESTUS and TULPIUS. 4. The *Inteſtines* alſo themſelves being greatly inflamed may periſh by a *Gangrene*, and be expelled by *piece-meals*. 5. The *Aphthæ* are often alſo purged downwards. 6. *Worms* and other Animals ſometimes alſo come out that way.

VII. THE *ſeventh* contains the *Lymph* and other Liquors, which being extravaſated form *Receptacles* for themſelves, or are ſomewhere collected unnaturally: for theſe are ſometimes by the power of *Cathartics* diſcharged from the Body by ſtool; but how that is done, can hardly be ſaid, tho' it is certain that it is done; for in a Dropſy a large quantity of *Lymph* is ſometimes expelled by a *Cathartic*, which is followed by a *ſinking* of the Belly.

FROM what has been ſaid, the following COROLLARIES may be deduced.

I. THRO' the Inteſtines may be expelled very *different* Bodies, and from *any* part of our Machine: for all *Purges* diminiſh the *reſiſtance* in the Veſſels which are *neareſt* to the Inteſtines; whence more Liquid is drawn thither by the *force* of the Atmoſphere; which is done alſo by the *contraction* or *elaſticity* of the Veſſels: but if the *reſiſtance* is greatly diminiſhed in the Inteſtines by a repetition of violent *Purgatives*, all the *Lymph* will be drawn down to their *emptied* Veſſels; and thence will ariſe an *excretion* of it. Wherefore the *Lymph* may be expelled from every part of the Body by *Cathartics.*

II. The quantity of this may ſometimes be ſo great, as even to exceed belief.

III. The Liquids which were wont to be *naturally carried* into the Inteſtines, and thence into the Veins by the Lacteal Veſſels and Meſeraic Veins, if they are carried *directly* to the *Anus*, may be *excreted* to the quantity of *four pounds* or more, in twelve hours. For example, ſuppoſe we ſwallow in twelve hours, all our *Spittle*, *Mucus*, and *Liquor* of the Oeſophagus, and theſe come to the middle of the Stomach, they will make there about ℥x, and the Stomach will ſupply about ℥xi of it's *Liquid*, and the inteſtinal Glands ℔i, the Pancreas ℥xi, and the Liver alſo will ſupply it's Liquor: from all which taken together we ſhall have above ℔iv. Whence we ſee that the whole Man may in a ſhort time be *purged* by the *Anus.*

IV. The *ſeven* kinds of *Secretions* and *Excretions* already mentioned may be ſo *changed* either by ſtagnation or mixing, that they can by no means be diſtinguiſhed; thus the *Mucus* of the Noſtrils, when it is firſt *excreted*, is a *thin* Lymph; but in a ſhort time it is ſo inſpiſſated, as to become a hard *cruſt*, and almoſt *cartilaginous.*

V. Some of theſe are driven out of the Body with a much *leſs force* than others: for the *Fæces* that are left by *food*, are eaſily thrown off by the *periſtaltic* motion of the Inteſtines, and are therefore expelled by the natural *force* of the Bowels without the help of any *Stimulus.* But now to bring out an *extravaſated* Liquid, there is more required, than the *periſtaltic motion*; namely, 1. That it be *drawn* into the Inteſtines: to which is required, 2. That the neighbouring Veſſels *receive* it: to which again is required, 3. That the *reſiſtance* of thoſe Veſſels be leſs, than the *force*, which impels the Liquid into them. Whatſoever therefore can ſufficiently diminiſh the *reſiſtance* of the Veſſels, will cauſe the Liquid to be received into them; but *reſiſtance* is ſufficiently diminiſhed by any cauſe, that *clears* and *empties* the Veſſels: but the *force* of this cauſe ought to be greater than the *natural force* of the Bowels; that it may *ſtimulate* the Veſſels ſtrongly, and bring them to *ſecretion.* Therefore a greater or leſs eaſineſs of *expulſion* depends entirely on the *various diſtance* from the Inteſtines of the matter to be expelled: thus the *dung* is more eaſily moved than the *pancreatic Liquor*, and this more eaſily than the extravaſated Lymph.

VI. The *expelling forces*, which, as appears from the *preceeding* Corollary, are *various* according to the *various* diſtance of the matter to be expelled, depend entirely on ſome *Stimuli*: and theſe *Stimuli* are ſuch, as may create ſome uneaſineſs by their *figure* and *ſolidity*; thus a grain of *Sand* immediately excites a *Convulſion* in the Eye, by which motion the Glands are compreſſed, and by that compreſſion evacuated; whence alſo an eaſy entrance is granted to new *Liquid.* It is the ſame with regard to *Purging*: for example, if any one, who eats only the *whiteſt* Bread, and is accuſtomed to go to *ſtool* only *once* in a day, ſhould eat the *courſeſt*, he would then have *two* or *three ſtools* in a day, and ſometimes attended with gripings; becauſe the particles of *Bran*, which are indiſſolvable on account of their *bulk* and *figure*, would *vellicate* the Bowels, and throw them into *contractions.* In the ſame manner other things operate alſo, as *Grapes*, &c.

4. Having now conſidered what things are *naturally* and *preternaturally* carried down into the Inteſtines, let us conſider what is required in *general* that they may be *expelled.*

THERE are *ſix* things required to the *expulſion* of the matter. For, 1. It is required that the *paſſage* be *open*; by the *paſſage* I underſtand the *continued Cavity* from the Mouth to the *Anus:* which may be *cloſed two* different ways; (α) by it's own *figure* being *changed:* which may be done, if one part is drawn within another, as in the Iliac Paſſion; or if the Meſentery be ſeparated by an Inflammation from any part of the Inteſtines; or laſtly by a *ſpaſmodic* motion of the Inteſtines: (β) by any matter *ſtopping* in the Inteſtines; as when the *Excrements* are indurated, by means of ſome glutinous matter, into a hard and almoſt ſtony ſubſtance, as ſometimes happens in Women, eſpecially when they are *big with Child*; or when any thing *hard* ſtops in the *Cæcum*, *cloſing* the Valve there; or when a *Schirrus* ariſes in the Inteſtines. 2. It is required that the *paſſage* be *ſmooth:* for it has pleaſed GOD to provide thro' the whole *Inteſtinal* Tube a ſort of *Soap*, that the *Fæces*, being *dried* by the ſqueezing out of the more liquid part, may eaſily ſlide through, and not remain immoveable and ſtop any where: but if that Soap is wanting, then the *Body* is *coſtive*; whence a far greater *force* is required to detrude the *Fæces:* therefore in this caſe ſhould be taken *Honey*, *Manna*, *Oil*, *Sugar*, *&c.* hence in the *Aphthæ*, the Belly, which at that time is *moſt bound*, is rendred *lax*, by glutinous *Clyſters*, of Honey, Sugar, and ſuch like. 3. A *Contraction* of the *ſpiral muſcular* Fibres, which encompaſs the Inteſtines thro' their whole *courſe*, and when they *act*, urge the ſides of the Veſſels towards the *centre*; alſo the contraction of the *Longitudinal* Fibres: for no *purging* Medicine can act, without increaſing, accelerating, and ſtrengthening theſe *motions* by *ſtimulating* them; which appears from the *pains* ariſing from *Purges*. 4. An *increaſe*

increaſe of the *motion* of all the parts ſerving to Reſpiration; I call this an *increaſe*, becauſe neither the *Fæces* nor *Urine* are naturally expelled without ſome Reſpiration: for this is manifeſt from Infants, while they are yet in their Mother's Womb, which, if the Membranes are broken in a difficult birth, draw in the *Air*, diſcharge their *Fæces*, and *defile* their Mothers; we may obſerve alſo, that when any Perſon goes to *ſtool*, he draws in a great quantity of *Air*, and immediately cloſes the *Glottis*, and then the *Air* being rarefied diſtends the Lungs, and they drive the Diaphragm downwards, in the mean time the *ten Muſcles* of the Abdomen contract themſelves, whence the Inteſtines being preſſed drive out the *Fæces*; but as ſoon as the Lungs are releaſed, the Abdomen is releaſed alſo, and the dejection of the *Excrement* ceaſes. Hence we ſee it is in vain to expect the effect of *Purgation* in *dying* Perſons; for the Reſpiration alſo fails at that time. 5. The *preſence* of ſome matter in the Inteſtines themſelves. 6. The *meability* of this matter, that is, a diſpoſition to be eaſily expelled. Now theſe are always required for a *Purgation* to meet with ſucceſs; but if the *Purgation* does not ſucceed becauſe of the defect of one of them, that defect may be remedied by *proper* Medicines. Therefore (α) if the *paſſage* be *obſtructed* either by a *Schirrus* or an Inflammation, a *Vein* is to be opened: (β) if the proper *Slipperineſs* is wanting, it is to be remedied by Honey, or Oil, or *glutinous* Clyſters: (γ) if the *contraction* of the Muſcles is deficient, it is to be reſtored by a light *Stimulus* of ſeaſonable Fruits: but if that defect ariſes from a faintneſs of the Spirits, then *Cordials* are of ſervice: (δ) if the transflux is hindred by *Cruſts* grown to the Inteſtines, then a Bath of *cold Water* is to be applied: and thus what uſes to be excreted by the cutaneous Pores, will be determined towards the Inteſtines, whence the *Cruſts* will be diſſolved and the *Purgation* will go on well. (ε) If there is nothing in the Inteſtines, there cannot be any thing drawn out of them; therefore a *Purge* ought not to be given to any one after two or three days *faſting*; becauſe in this caſe it would have no effect, on account of the *weakneſs* of Reſpiration, and *deficience* of matter. (ζ) If the matter is ſo hard, that it cannot be moved, it may be reſolved by a long continuance of drinking *Water* and *Oil.*

5. WE have ſeen now what matter is *naturally* contained in the Inteſtines themſelves, and uſes to ſtop *preternaturally* in them, and what may be derived towards them, and as this is *manifold*, it thence eaſily appears, that the *names* of the Medicines deſtined to *expel* it, muſt be *various*. And thus, 1. Thoſe which expel only the *Fæces Alvi*, that is, the *natural remains* of what is taken into the Stomach and Inteſtines, and derive nothing elſe from the other parts of the Body into the Inteſtines, are called *Eccoprotics*; ſuch are thoſe which open the *paſſages*: hither therefore belong *Oils*, *Diluents*, and *Clyſters*; it is required however that ſome *ſlight Stimulus* be added to them, ſuch as *Salts*, and *mild Aromatics*. 2. *Phlegmagogues* are thoſe which draw out the *pituitous* matter or *Phlegm* by *ſtool*: now the Ancients called every Liquid that is thicker than *Serum*, ſuch as the *Mucus* of the Noſtrils, by the name of *Phlegm* or *pituita Vitrea*; therefore if it be deſcribed according to appearance, every whitiſh, limpid and tenacious matter like the white of an Egg, which the Antients more ſtrictly called *pituita Vitrea*, will be *Phlegm*: which conſiſts of *three* ſorts of matter, (α) Of a *foul morbid* matter of the Stomach, and this ariſes from ſome *glutinous* ſubſtances ſticking in the Stomach, or from the emi-

nent *Villi* being *abraded* by that *mucous Liquid* of the Stomach, by means of *Acrimony* and a vehement *Stimulus*: (β) From *Mucus ſwallowed down*, the preſence of which in the Inteſtines no one is ignorant of: (γ) From a like ſubſtance *produced* by ſtagnation or mixture: for by ſtagnation and mixture ſurpriſing maſſes may be produced; as may be ſeen in BONETUS's *Sepulchretum Anatomicum*, *Cap. de morbis Inteſtinorum.* Hence there is need of various *Stimuli* to purge *Phlegm*: for if only the *natural Mucus* is to be purged out, it may be eaſily performed by means of *Eccoprotics*; but if our Bowels are weak, then we ſtand in need of a greater *Stimulus*, ſuch as *Phlegmagogues* ſupply. 3. *Cholagogues* are thoſe which *ſtimulate* with ſo much force, as not only to expel the *Mucus*, but alſo being received by the *Meſenteric* Veſſels, to increaſe the *ſolution* and *motion* of the Blood in the Liver, or by *ſtimulating* the Veſſels to promote a more plentiful *flux* of the Blood towards the Liver: ſuch are *Semi-Cauſtics*, as *Scammony*, *Jalap*, *Mercury*, *&c.* which carry the *Bile* down from the Liver into the Inteſtines, and thence expel it. 4. *Hydragogues* are thoſe which expel not only the *Bile*, but alſo the Inteſtinal *Mucus*, and even the *pancreatic Juice*: and that (α) by hindring any thing from entring the Lacteals, which uſed to return into them; and this is ſometimes produced by a *very ſlight* cauſe; for let any one walk in a *cold Air*, ſo that his Feet be *cold*; then preſently his whole Body, and the Inteſtinal Glands, and the Abdomen will be conſtringed by the *cold*, the Excretory Ducts will be ſqueezed, and the Ducts which carry the Liquids into the Blood will be cloſed; hence therefore the *reflux* will be hindered, and *Gripes*, that is, *ſpaſmodic Contractions* will ariſe, and now the paſſage of the Liquids thro' the Inteſtines will be promoted, whence at length *ſerous* evacuations will follow: (β) by increaſing the *ſecretion* of the Liquids, and eſpecially of the pancreatic Juice and Inteſtinal Glands: which is done by diminiſhing the *reſiſtance* of the Secretory Veſſels, and increaſing the motion of the Liquid both *ſpecial* and *general* thro' the whole Body. Thoſe which effect this, are *Cauſtics* and Poiſons; as *black* and *white Hellebore*, *Euphorbium*, *Lapis Infernalis*, Boyle's *Pilulæ Lunares*, &c. (a) 5. In the laſt place, *Melanagogues* are thoſe which draw down the *black matter* by the Inteſtines. This *black matter* has a various ſmell, taſte, acrimony and tenacity, reſembling Glue; and this is what the Ancients called *Atra Bilis*; for when they obſerved *ſuch* a matter to be dejected by Perſons afflicted with *Melancholy* and a *ſwelling* of the Spleen, on taking a ſtrong *Purge*; they concluded that matter to be collected from *aduſt* Blood, and depoſited in the Spleen as in a *ſink*; whence they imagined it to be carried into the *Cavity* of the Inteſtines by Veſſels proper for this work, but unknown: but it is well known that the Spleen remits whatſoever it receives, thro' the *Gaſtro-epiploic* Veſſels into the *Vena Porta* and Liver; moreover if the *efflux* of the Blood from the Spleen is hindred by the Veſſels being *obſtructed* by any cauſe, it is *coagulated* and becomes *black*, and if it is then moved by vehement *Purges*, it is driven towards the Liver, and there making an *Impetus*, being aſſiſted by a ſtrong ſuccuſſion of the whole Body and of the Abdominal Muſcles, which ariſes from the violent *ſtimulus* of the *Purge*, it *dilates* the Biliary Veſſels or *burſts* them; and thus makes a way for it's ſelf into the Inteſtines. Therefore to

move

[(a) See the Noble *Author*'s Deſcription of theſe *Pills*, in his Treatiſe of the *Uſefulneſs of Experimental Natural Philoſophy*, Part II. page 308.]

move ſuch a ſubſtance, there is need of a very great and *cauſtic* power, which may *diſturb* both the Solids and Fluids of the Body, and excite *ſpaſmodic* motions. Now this *black Matter* may proceed not only from the Spleen, but alſo from other places in the Body, and is wont ſo to do: for *ſuch* a Matter may be gathered in the Liver it's ſelf from *burſten* Veſſels; and alſo in the Pancreas; ſuch a *Maſs* alſo may be conſtituted by the Blood, *extravaſated* any where in the Inteſtines, and *coaleſcing* in the ſame place with the *Phlegm*: but this *laſt* ſort may ſometimes be excreted only by the *natural* motion of the Inteſtines, or by ſome *eccoprotic* Medicine a very little *augmented*: the *Atra Bilis* alſo collected in the Liver may be expelled by a mere *ſhaking* of the Body, occaſioned by bending or being carried in a coach. And hence we may conclude, that the *Atra Bilis* may ſometimes be *brought out* by a *gentle Cathartic*, and ſometimes only by a *ſtrong* one, according as it is more or leſs remote from the Inteſtines.

6. But now before I enter upon the Hiſtory of *Purging* Medicines, I ſhall premiſe ſome Observations that greatly relate to them.

I. Some *Purges* act only by *irritating* the Fibres and muſcular parts of the Inteſtines; and *others* do not *act*, 'till they enter the Blood Veſſels, and are mixed with the *Maſs* of Blood.

II. Some produce *various* violent effects, as *nauſea*, *fainting*, *&c.* before they purge; and theſe ſeem to *diſperſe* themſelves over the whole Body: but others do not produce theſe effects, and therefore do not ſeem to be ſo univerſally *diſperſed*, as the former; ſuch are *Cryſtals of Tartar*. Whence it appears, that a *nauſea* is not neceſſarily produced by all *Purges*, before they *work*.

III. All *Purges* are naturally *Vomitories*, and neceſſarily become ſo, if they are given in too *large* a *doſe*; nay the moſt mild *Purge*, if taken in too large a quantity, becomes a *Vomitory*: and thus *Oil* newly expreſſed, which is the moſt gentle of all *Purges*, if taken too liberally, provokes a *Vomiting*.

IV. The *paſſions* of the Mind alone will no leſs efficaciouſly *purge* both *upwards* and *downwards*, than Medicines; which is obſerved in Perſons ſtirred by *anger*, or ſtruck vehemently with *fear*: and this depends on the *motion* of the humours and ſpirits being diſturbed by the *paſſions*.

V. Most Perſons may be *purged* by the mere *ſmelling* of a Medicine; and if ſuch fall into thoſe diſtempers, which deſtroy the *Smelling*, they are not then *purged*, tho' the Medicines be even applied to their Noſtrils. The Examples of *Purgation* being produced by the ſmell *alone* are not a few; as in the *Hiſtory of the Royal Academy of Sciences at Paris*, for the *firſt year* (*a*), and in BOYLE *of Effluviums* (*b*). Nay and ſometimes a *Purging* is

(*a*) *Amſterdam Edition, page* 69, where a notable Example is related of a moſt violent *Purging*, both *upwards* and *downwards*, ariſing only from the *ſmell* of Damask Roſes. See alſo an account of a like *Purgation* in PECKLIN, *Exercitat. de Purgantibus, cap.* 10. *pag.* 115, where there are Examples out of CARDAN, FALLOPIUS, and SALMUTH. See alſo TH. ERASTUS, *Diſputat. de Propr. Medic. cap* 60.

(*b*) [“ I know a Doctor of Phyſic, that is uſually purged
“ by the Odours or Exhalations of a certain Electuary, whoſe
“ Cathartic Operation, when it is taken in ſubſtance, is wont
“ to be but languid. And another Doctor of my acquaintance,
“ cauſing good ſtore of the root of black Hellebore to be pounded
“ in a mortar, moſt of thoſe that were in the room, and
“ eſpecially the party that pounded it, were thereby purged,
“ and ſome of them ſtrongly enough. And the learned SENNERTUS
“ ſomewhere affirms, that ſome will be purged
“ by the very Odour of *Colocynthis*.” BOYLE *of Effluviums, page* 62.]

excited merely by the *ſight* of Medicines in ſome Perſons; as may be ſeen in BARTHOLIN, *Hiſtor. Anat. & Med. Centur.* V. *Obſerv.* 64. (*c*): alſo in PECKLIN (*d*).

VI. SOME are *moved* by the ſole *external* application of *Purges*; as may be ſeen in the *German Ephemerides*, *Decur.* 2. *Anno* 10. *n.* 43. and is proved by that well known plaſter of Oxes Gall, Coloquintida, &c. which goes by the name of *Unguentum de Artanita majus.*

VII. SOME are vehemently purged, only by the *hindrance* or *diminution* of the Sanctorian Perſpiration: and this is generally cauſed by *moiſt*, eſpecially *foggy* Air; whence HIPPOCRATES ſaid that *the South Wind produces a looſeneſs of the Belly*, *Diarrhœas*, *Colliquations*; *but the North Wind coſtiveneſs and dryneſs of the Belly* (*e*).

VIII. IT ſometimes happens, that *Purgation* is excited merely by external *motion*; which is ſufficiently known to happen to thoſe who firſt go to ſea, and to ſome when *carried in a coach.*

COR. I. A very ſmall *bulk* of Body oftentimes is ſufficient to produce the *greateſt* effects.

COR. II. THE Body which *acts* is generally very *fine*; as appears from *purging Plaſters*, for the *bulk* of them is hardly diminiſhed, when the operation is over.

COR. III. THE *acting* Body is often very *volatile*; as appears from *Aloës*, the fume of which *purges*, but

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(*c*) Where there is an Example of a very ſtrong *Purgation* by the *ſight* of *Antimony.* To this we may add what the ſame AUTHOR relates in the *Acta Hafnienſia*, *Vol.* 5. *Obſerv* 49. *pag* 136. from the Obſervation of OLAUS BORRICHIUS, of a plentiful *Purgation only* by the *ſight* of ſome Cathartic *Pills.* Conſult alſo MARCELLUS DONATUS, *de Hiſtor. Med. mirab. Lib.* 2. *cap.* 1. *pag. m.* 91.

(*d*) *Exercitat. de Purgant. cap.* 30. *pag.* 409.

(*e*) *Aphoriſm. Sect.* 3. *Aph.* 17.

but when it's *ſubtile* parts are flown off, that which remains is quite *unactive.*

COR. IV. THE *cathartic* part of a Body is the *leaſt* with regard to the whole *bulk* (*f*); as appears from Euphorbium and Coloquintida, which being diſſolved in *Water*, and gently evaporated, become *unactive* maſſes; whereas the part evaporated was very *ſmall*, and ſcarce *preceptible.*

(*f*) See the *Note* annexed to page 84 and 85.

CHAP. IV.

Of ECCOPROTICS.

1. ECCOPROTICS, as was ſaid before, are thoſe *purging* Medicines, which do not much *diſturb* the Body in their *operation*, and which *expel* nothing, or at leaſt very little from our Body, beſide the *contents* of the Stomach and Inteſtines; for it is impoſſible to find any *Eccoprotic* abſolutely ſo called, which does not *draw* any thing out of the Inteſtinal Glands; for as the pureſt, that is, *Rain-water*, when put into the Eye to get out ſand, forces out tears, by ſlightly *ſtimulating* it; ſo alſo an *Eccoprotic*, tho' ever ſo *mild*, yet always *expels* ſomething together with the *Fæces*, by *moving* the Inteſtinal Glands.

2. NOW all *Eccoprotics* may be reduced to *three general* Claſſes.

I. THE *firſt* Claſs contains whatſoever act by *lubricating* the *Membranes* of the Inteſtines, and their contents; ſuch as *recent Oils* of Animals; I ſay *recent*, for if they are not ſuch, but on the contrary are *kept* too long, they become *acrid*, and muſt be referred to the Claſs of *acrid Purges*; but as long as they are *freſh*, ſo long they *lubricate* by their oilineſs: hither therefore belong, 1. *Butter*, that is, the fat and oily parts of the *Chyle*, ſeparated by a vehement concuſſion from the aqueous and ſaline parts. 2. *Cream*, but it muſt be *freſh*, as was ſaid before. 3. All *fat Broths* prepared of Animals, eſpecially the *Broths* of thoſe parts which are about the Meſentery; hence alſo *Decoctions* of the Inteſtines and Meſentery are eſteemed by the *Italians*, as the beſt remedy for indurated *Fæces*. 4. *Marrow* and *marrowy* parts of Animals. 5. All their *recent Fats*. 6. Their *Bile*, which tho' it *acts* by it's *ſaponaceous* and *ſtimulating* virtue, yet ſo far as it is *oily*, is to be accounted *lubricating*. 7. All *Oils* expreſſed from Vegetables, as of *Olives*, *Almonds*, *Piſtachios*, *&c.* moreover it is to be obſerved, (α) That the Fruits and Seeds from which they are expreſſed be *ripe*; for otherwiſe they *aſtringe*: (β) That they be alſo *freſh*; for otherwiſe they become *acrid* and very *purgative*: (γ) That they be *mild*; by which mark they are diſtinguiſhed from the *Oils* of *Eſula*, *Euphorbium*, *Spurge*, *Tobacco*, and ſuch like *acrid* Plants. It is ſometimes diſputed, whether theſe mild *Oils bind* or *relax*; becauſe, if they are taken in a Dyſentery, they *bind the Belly*, but in Hypochondriacal Affections *relax* it: but if we conſider that the cauſe of a Dyſentery is ſomething *acrid*, *vellicating* the Fibres of the Inteſtines, and that the property of *mild* Bodies conſiſts in *obtunding Acrids* by ſheathing them, we ſhall eaſily perceive why they are of ſervice in a Dyſentery: beſides in Hypochondriacal Affections, the *paſſages* of the Inteſtines are very dry and criſp, and their ſurfaces unequal and rough; hence *mild Oils* being applied to them take away their criſpneſs and corrugations, by *lubricating* them, and thence *relax* them. 8. All *mild*, *ripe* and *fat Fruits:* as *ſweet Almonds*, *Filberts*, *Walnuts*, *Coco*, *Piſtachios*, *Figs*, *Linſeed*, *&c.* and all *farinaceous* Bodies which are *viſcous:* all theſe Fruits are called *lenitive*; and if they be chewed in a morning, ſwallowing the juice, and ſpitting out the reſidue, they gently *relax* the *Belly*. 9. All *Decoctions* called emollient, that is, which draw a fat, fine and mild *juice* from Vegetables: ſuch as *Decoctions* of *Mallow*, *Marſhmallow*, *Pellitory*, *Barley*, *Oats*, *Gromwel*, *Buckwheat*, *&c.* for theſe being *boiled* make a ſort of lubricating Emulſion. 10. The *ſaponaceous* parts of Vegetables: now *Soap* is a Body conſiſting of *Oil* and *Salt* ſo combined together, as to be diſſolvable in *Water*, by an equable ſolution, that is, that the *Oil* does not ſwim above the *Water*, but is mixed with it. Moreover *Soaps* are of two kinds; either *natural* or *artificial:* the *natural Soaps* are the *juices* of Vegetables; of which there are *ſix* ſorts, which gently *lubricate*. (α) *Manna*, which is nothing elſe than a *juice*, exuding from the Aſh, *concreted* and *endued* with an *abſterſive* and *ſaponaceous* taſte; hence it's *ſaponaceous* part *lubricates* and the other *ſtimulates*. (β) *Caſſia* which is a Fruit endued with a *viſcoſity*, almoſt like *Honey*; whence it gently *lubricates*. (γ) *Honey*, which is nothing but a *ſaline* and *oily juice* extracted and boiled out of the *flowers* of Plants by the power of the Sun, then concreted by *cold*, and gathered into little drops, in which condition it is gathered by the Bees. (δ) *Sugar*, which *lubricates* by it's *viſcoſity*. (ε) *Syrups* made of the former *four*, and other *juices* of Vegetables. (ζ) *Mulſum*, which is called alſo *Hydromel* and *Melicratum*, and is nothing but *Honey* diſſolved in *Water* and boiled. In this Claſs of Eccoprotics are contained alſo, 11. *Artificial Soaps*, that is, thoſe which are made by *Art* of Salts and Oils mix'd: and of theſe there are *two* ſorts; the firſt contains (α) a *Soap* made of an alkaline fix'd *Salt* and expreſſed *Oil*; thus *Venice Soap* is made of *Salt* of Tartar and *Oil* of Olives; (β) a *Soap* made of an alkaline fix'd *Salt* and diſtilled *Oil*, which is called *chemical Soap*; (γ) a *Soap* made of a volatile alkaline *Salt* of Animals with diſtilled *Oil*; which is commonly called *ſal volatile oleoſum.* The ſecond ſort includes *Soaps* made of Acids and Oils; as of *Vinegar*, and *Oil boiled* a long time together, and of *Oil of Vitriol* with three or four times it's quantity of *common Oil.* To this Claſs of *Eccoprotics* may be referred alſo, 12. All that have been *mentioned* already applied *externally*, either after the manner of a *Balſam*, a *Friction*, or a *Fomentation.* 13. The ſame *thrown up* in form of a *Clyſter*; which oftentimes are of more Service, than if they are *taken in* at the Mouth, eſpecially if the *diſorder* is ſeated in the *great* Guts.

But in order to ſee, when theſe Medicines do *harm*, and when they do *good*, or to determine the *uſe* of theſe *Eccoprotics*, the *following* Corollaries muſt be obſerved.

Cor. I. The *uſe* of theſe *lubricating* Medicines is beneficial to thoſe Bodies that are dry, hot, atrabilious, troubled with the Piles, that enjoy a plentiful Perſpiration, and have very ſtrong Bowels; in which therefore every Liquid *contained* in the Inteſtines, is taken into the Lacteal Veſſels and *abſorbed* by them; as Sanctorius demonſtrates: now this *dryneſs* of the Veſſels very often happens to the Inhabitants of *hot* countries; for whatſoever ſticks on the *outſide* of the Body is always *abſorbed* and deterged by the *external heat*; now it is known, that the *more* the Secretory Veſſels are drained, the *greater* is the *influx* of Liquid into them; whence it comes to paſs that the *inner* parts dry; and thus the Inhabitants of ſuch countries become ſo obnoxious to the *Atra bilis* and *Piles*. The *Atrabilious* are thoſe who, for the reaſon juſt mentioned, have a *dry* and *lean* habit of body: becauſe the *moſt liquid* part of the Blood is exhauſted, ſo that their Blood, when taken out of the Body, appears *blackiſh*; and in ſuch Perſons the *excrements* grow as hard as a ſtone, thro' *want* of moiſture. Thoſe who are ſubject to the *Piles*, are ſuch as thro' *want* of Liquid in their Inteſtines have hard *Excrements*; which then *ſtop* at that *acute* angle, which is formed by the *Colon* and *Rectum*; whence it comes to paſs, that the Veins of the Inteſtines there ſituated, namely near that weight are ſtrongly preſſed and ſtraitened; wherefore the Blood not being able to aſcend, ſo *inflates* and *diſtends* theſe Veſſels, that they *burſt* in the places where there is the leaſt *reſiſtence*, namely about the orifice of the *Anus*; but ſometimes they burſt *within*, and then they are called the *inward Piles*; and ſometimes *without*, and then they are called *outward*. To ſuch Perſons *lubricating* Medicines are of moſt ſervice.

COR. II. THE *lubricating* Medicines mentioned above often conduce more to promote *Purgation*, than the ſtrongeſt *Purges*; eſpecially in ſuch Perſons as are deſcribed in the *preceding* COROLLARY: for the *Italian* and *Spaniſh* Phyſicians know that if ſuch Perſons were to be *purged*, and *acrid Purges* were to be given them, Anxieties, Sweats, Vomitings, and other dreadful ſymptoms would ariſe, without any *Purgation*; but if any thing *lubricating*, as *Oil*, &c. were given them, they are not ignorant that a *relaxation* of the Belly would immediately follow. But the reaſon, why *acrid* and *ſtrong*, things are hurtful to ſuch Perſons, is obvious; becauſe the force of *acrid Purges* conſiſts in the moſt thin and volatile part; thoſe therefore, whoſe Bowels are very *ſtrong*, drive all theſe *purging* parts *inward* and *abſorb* them; whence the whole Body is *ſtimulated* and *diſordered*; and by this means thoſe become *Diaphoretics* and *Sudorifics*, which ought to perform the office of *Purges*. But in the *colder* regions it is quite the *contrary:* where the *ſtronger* agree, ſuch as *Hydragogues* and *Cholagogues*.

COR. III. THE *Belly* being *moved* by means of theſe Medicines, does not become *bound* afterwards; as is uſual upon the operation of other *Purges*: the reaſon is, becauſe the Veſſels and Glands of the Inteſtines are not ſo much *emptied* and exhauſted by theſe, as by the *ſtronger Cathartics*; therefore when their operation is *finiſhed*, a *ſufficient* quantity of Liquid is ready in the Glands, to *lubricate* the Inteſtines: but in Men whoſe Bowels are *ſtrong* it is quite otherwiſe.

COR. IV. THE beſt *uſe* of thoſe *Lubricaters* is when the *Fæces* remain ſtuffed and hardened in the *Colon*; which happens to ſuch as are deſcribed in the *firſt Corollary*, and *new-born Infants*, whoſe *Bellies* ought to be *looſened* by a *Suppoſitory* of *Soap*; for if the expulſion of the *Fæces* is attempted by a *Cathartic* taken by the *mouth*, they die in *Convulſions*.

COR. V. THESE Medicines are hurtful to ſuch as are either *bilious*, or *lax*, or *aqueous*. The *bilious* are properly thoſe, who have *too great* a quantity of *bile* carried thro' the Inteſtines, it's *reflux* toward the Liver being hindered; ſince therefore the *bile* flowing thro' the Inteſtines, *lubricates* them abundantly, other *Lubricaters* ought not to be adminiſtred. I call thoſe *lax*, the *paſſages* of whoſe Stomach and Inteſtines are too *ſmooth* and thence become *flaccid*. The *aqueous* are thoſe, in whom the *aqueous* part of the Blood is accumulated in every part of the Body: ſuch moreover are thoſe whoſe expelling heat and perſpiration are deficient, and therefore every thing is *lax* in them; ſuch therefore ought not to be moved by *Purges* that are *lubricating*, but by the moſt *acrid*.

II. The ſecond Claſs of *Eccoprotics* are thoſe which move the too much cohering *excrements* by diluting them: ſuch as 1. *Common water*, which if it be *drank* ſo as to *go* to the Inteſtines, and not to the circumference of the Body, becomes a *purgative Diluent*; but it will *go* to the Inteſtines, provided the *four following* rules be obſerved, which indeed ought to be obſerved alſo in the uſe of all Eccoprotics; (α) Let it be drank in the Morning upon an empty Stomach; (β) Let it be drank in the cool Air; (γ) Let ſweating be avoided; (δ) Let the *water* be determined towards the Inteſtines by gentle walking in the cool Air. 2. The *mineral Waters*, whether *Acidulæ*, as the *Spaw*; or *Semi-mercurials*, as thoſe of *Aix-la-Chapelle*; or *ſulphureous* or *vitriolic*, as thoſe of *England*, [*Bath*, *Tunbridge*, *&c.*] 3. *Waters* of Animals: ſuch as, (α) *Milk*, which being drank *freſh*, the above-mentioned conditions being at the ſame time obſerved, dilutes the *Fæces*, and looſens the Belly; (β) *Whey* taken after the ſame manner; but if the Body is *moved*, it becomes *diaphoretic* or *diuretic*. (γ) *Butter-milk*; (δ) *Broths* prepared of the parts of Animals; (ε) All that are *compounded* of theſe; (ζ) *Fomentations* and *Clyſters* prepared of the ſame.

Cor. I. All theſe agree with ſuch Perſons as are deſcribed in the *firſt* Corollary of the Claſs of *Lubricaters*: therefore they are injurious to the *bilious*, *lax*, and *aqueous*, but moſt to the *lax*; they are leſs hurtful to the *bilious*, than the *Lubricaters*, as being more *watry* than thoſe: and thus if *mineral* *waters* are drank in a Dropſy ariſing from the laxneſs of the Veſſels, they moſt certainly bring *Death.*

COR. II. THESE are the beſt *helps* in all burning Fevers, and in all Inflammatory Diſeaſes, whether they be taken by the *Mouth*, or by the *Anus*, or in form of a *Fomentation*; or by any other means.

III. THE third Claſs of *Eccoprotics* contains thoſe which by lightly ſtimulating the Inteſtines, expel the *Fæces* thence, without *diſturbing* the reſt of the Body: theſe are now called *Lenitives*; but the Ancients called them *Minoratives*, that is, which do not *draw out* a quantity of the *Fæces to be expelled*, all at once, but by degrees. Hither therefore belong all Medicines whatſoever, that are able to ſtir the *villi* of the Stomach and Inteſtines into *excretory* motions: but this ought to be done without *diſturbing* the reſt of the Body; and therefore the *two* following conditions are altogether neceſſary; 1. that theſe Medicines be ſomething *acrid*; or, 2. ſo *thick*, as not to be able to *enter* the Lacteal Veſſels, or to be *determined* toward the Inteſtines, or to be received into the maſs of *Blood*; for it is manifeſt that ſome *Purges* work downward, if they are *hindred* from being *mixed* with the Blood; but if they are not *hindred*, then they operate upon the *other paſſages*, as is manifeſt from the uſe of *Whey*.

(α) Some of thoſe Medicines are taken from Animals; and are, 1. The *acrid* juices of Animals, as (α) *Urine*, which being drank in the cool Air; and thereby determined *downward*, is able to *purge*; the ſame is ſometimes evaporated to a *Soap*, of which Pills are made, which looſen the *Belly*, provided the Perſpiration be hindered. (β) *Bile* which acts by it's own *Acrimony*; but it ought to be a little *inſpiſſated*, that it may be like *Soap*, with which it has a great affinity; and ſo from this *inſpiſſated Bile* may be formed *ſtimulating* and *cathartic*

Pills, which ſhould be *gilded*, if you intend to conceal the *kind* of this remedy; (γ) *Milk*, which ſometimes by growing *acid* in the Stomach, becomes a *purgative* alſo by it's own *Acrimony:* whence we ſee that all the beſt Practitioners give *Sheeps*, *Goats*, or *Aſſes Milk* to Phthiſical Perſons, to keep their *Bellies open*; (δ) *Whey*, which has a *ſaponaceous* taſte: but if it turns *acid*, it then becomes *acrid*, and therefore *purges* by ſtimulating after ſlight *gripings*; which happens, becauſe the *Fibres* are irritated by ſuch an *Acrimony*, and being once irritated *contract* themſelves, and by this means the Air, and other things are then *included* between the *contracted* parts; but that Air thus *included* is expanded by *it's own elaſtic* force, and preſſes the *Fibres*, and greatly diſtends them: thence theſe *Gripes* ariſe, which preſently ceaſe when the *contraction is diſſolved*; and then we generally perceive that the *excrements* immediately deſcend towards the *Anus*, from the place where the *Spaſm* was, which ſoon after are expelled. (ε) *Acid Milk.* (ζ) *New Cheeſe*; for when that is not well *digeſted* in our Bodies, or juſtly ſubdued by the *Bile*, whilſt it remains in the Stomach, it there turns *acid*; as often happens in Infants. (η) The *Curd of Milk*, which is found in the *Stomachs* of Calves; for this ſometimes will move the *Belly* with a *ſhivering*. (ϑ) *Rotten Eggs*, which ſometimes only being *ſmelt*, will make the Stomach work both upward and downward; and if they are taken in ever ſo ſmall a quantity, *purge* vehemently. 2. There are ſome *Eccoprotics*, taken from the *ſolid* parts of Animals: as (α) *Salts* which are contained in all theſe *Solids*, as in the Bones, Nails, Fleſh, *&c.* for theſe parts if they are *freſh*, and boil'd into a pure Liquid, become *ſaline*; and this *Salt* is not perfectly *volatile*, but, like Sal Ammoniac, *ſemi-volatile*

latile and *ſemi-fix'd*; which property is required in this place. (β) The *ſemi-putrid* parts of all Animals: for thus Fleſh *half putrified* looſſens the *Belly*; if it is more *putrid*, it produces a *Diarrhœa*, but if it acquires a ſtill greater degree of *putrefaction*, then it excites a *Dyſentery*, and the ſame often happens to *oily* and *fat* Men: the ſame may be ſaid of Lard, Fat and Marrow *half putrid.* (γ) Some *entire* Animals, ſwallowed *crude*; as *Oyſters*, which have an *alkaline* nature, as appears from that moſt agreeable *ſaltiſh liquor* contained in their ſhells: thus alſo ſome *little Fiſhes*, which are armed with *prickles*, whoſe *laxative power* however is not owing to any *ſpecific* quality, but only to thoſe ſtimulating prickles. (δ) The *Juices*, *Fleſh*, *Fats*, *Eggs*, and all other parts of Animals, if preſerved with *pickle*, or *marine Salt*; for from their *oily Soap* and *Salt* a third ſort of compound, in a manner *ſaponaceous*, ariſes: hither alſo belong all *ſalted Food*, by the continual uſe of which in the Navy, *Diarrhœas* frequently ariſe. (ε) The *Dungs* of Animals, which contain a *Salt* approaching to the nature of *Nitre*; and thus the *Italians* make uſe of the *Dung* of Peacocks, Pigeons, *&c.* to *looſen* their *Bellies*: the beſt are thoſe which are taken from Animals feeding only on Vegetables; becauſe they are ſomething *acid.* But that *Salts* extracted from *Dungs* are *nitrous*, is manifeſt from hence, that if ſuch *Dungs* being gathered into heaps, and ſprinkled with the Aſhes of burnt Plants, are ſuffered to *rot*, the *Salt*, which is gathered from them by diſſolving, evaporating, and cryſtalliſing, concretes into *Cryſtals* which are plainly *nitrous*; and this obtains chiefly in Animals that do not uſe *Sea Salt*. Hither alſo are to be referred the *juices* expreſſed from the *Dung* of Animals, hence in Fevers and other *acute* diſeaſes, as in the Small Pox, Meaſles, *&c.* in which the *Belly* ought to be *looſened* gently, and without much *diſturbance*, the juices of the Dung of *Goats*, *Sheep*, *Horſes*, and ſuch like are commended. (*a*)

(β) THERE are alſo many *Eccoprotic* Medicines from Vegetables, that are gently *ſtimulating*; ſuch as 1. all ſeaſonable Fruits, whether crude, ripe, acrid, rough, acid, or ſweet; as *Apples*, *Pears*, *Plumbs*,

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(*a*) Conſult ETMULLER, *Schroder. Dilucidat. P. I. Sect.* 3. *pag. m.* 223, who prefers *Sheeps dung* in the Small Pox, and *Goats* in the Meaſles, and commends *Horſe dung* in both of them. But concerning this ſort of Remedies eſpecially *Horſe dung*, the juice of which is the moſt common of all, the following judgment is given by JUNCKER, *Conſpect. Therap General. pag.* 345, and 346. “(1) It is thought to gain a *diſcutient* quality from the feeding on Oates, and is commonly much extolled in the Spaſmodic Colic, Hyſteric Paſſion, Jaundice, Meaſles, and Small Pox, which is ſaid to be thrown out by the juice of it alſo in the Quinſey, and above all in the Pleuriſy; whence ſome affirm, that the *Syrupus* B. LUTHERI which is ſo highly celebrated in the Colick and Hyſteric Paſſion, is prepared of theſe *Excrements*, (Compare ETMULLER): but they are generally boiled with malt liquor, and this *decoction* is drank by ſome with great pleaſure in Defluctions of the Breaſt, and is commonly called *das Pferde-Bier*. (2.) It is alſo commended *externally* in the Quinſey and Strangury. But this remedy is not always equal to the commendations beſtowed upon it, for it is nauſeous to many; and therefore may be left for ſuch, as find a pleaſure in the *uſe* of it.” So far JUNCKER. Concerning theſe Medicines alſo, DAN. LUDOVICI, the moſt ſagacious Writer of *Pharmacy*, had long ago pronounced that, theſe are filthy, and fitter for the whims of Quacks, old Women, and Dotards, than for the elegant *practiſe* of Phyſicians. See his *Pharmacia Mod. Sæc. Applic. Diſſert, I. Cap. de Purgantibus Vomit. pag. m.* 85. and in his Chapter *de Aperientibus &c. pag.* 227. he ſays, it was commendable in the *Dutch* Soldiers to drive off with *dung* the *Indians* in *Java* that aſſaulted them; but it is not ſo in a Phyſician of character. Hence therefore a little afterwards he leaves this *magma* to be gathered by the *Egyptians* and dried for fuel. But if any one deſires to know more of theſe *filthy Medicines*, he may conſult that *Treatiſe*, publiſhed in *Germany*, if I do not miſtake, under the title of *Medicina Stercoraria*.

Plumbs, *&c.* and *Berries* alſo, without any exception; all which uſe to excite *Flatuſes*, tho' ſome *more* and others *leſs*: their *eccoprotic power* alſo depends on an *acrid Salt*, which lightly and ſucceſſively *ſtimulates* the Inteſtines. 2. The expreſſed *juices* of thoſe *Fruits*, whether crude, or boiled into a Syrup. 3. The parts of thoſe *Fruits* which are not *diſſolvable*; as *Rinds*, *Stones*, *&c.* which being retained in the Stomach, contract a notable *Acor*, whence from *mild* they become in a manner, *epiſpaſtic* or *ſtimulating* and *purge* with Gripings: and thus oftentimes in tender Infants, whoſe Stomachs are not able to diſſolve and digeſt thoſe Bodies, they cauſe a dangerous *purging*; which ſometimes alſo ariſes from dried *Currants*, *Prunes* and ſuch like, for theſe Fruits are not diſſolved in the Stomach, but are thrown out whole, together with the other *Fæces*; therefore unleſs they are ſoon enough expelled, they contract a vehement *Acor*, and violently *ſtimulate* the Inteſtines; whence a *Diarrhœa* ariſes.

4. THE *Flowers* of ſome Plants, as of *Violets*, *damaſk* or *pale red Roſes*, and *Peaches*, either taken in Powder, or in a Conſerve. 5. *Native Soaps*; ſuch as (α) *Honey*; the *Acrimony* of which appears from hence, that it deterges Ulcers and Wounds: hither belong alſo the *Liquors* made of *Honey*. (β) *Sugar*; for this being a ſort of *Salt* gathered from the Sugar Canes, muſt therefore *ſtimulate* from it's own nature. (γ) *Manna*; which, as was ſaid before, is the *juice* of the *Aſh*, exuding from the tree at the time when the *Salt* and *Oil* are intimately united. (δ) All *Sapæ*, or *Robs*, that is, Inſpiſſations of ripe *juices boiled*: hither alſo are referred the *juices* of *ripe Fruits* newly expreſſed; as of *Caſſia* and *Tamarinds*; alſo that excellent *Sapa* or *inſpiſſated juice* called *Aloës*: to theſe alſo may be added *acrid*

aromatic Gums; as *Gum Ammoniac*, the *ſtimulating* power of which is manifeſted not only by the *acrid* taſte, but by it's promoting Perſpiration by *ſtimulating*, on being applied to the Skin; alſo *Bdellium*, *Sagapenum*, *Opopanax*, *Myrrh*, and all things of this kind, which by their *viſcid* parts *lubricate* the Inteſtines, and *ſtimulate* by their *acrid* parts.

(γ) THERE are ſome *Eccoprotics* conſiſting of *Salts* only: ſuch as, 1. *Native fixed Salts* of Vegetables: and theſe are of *two* ſorts, (α) Thoſe which are extracted from the *crude juices* of Plants, by means of *Cryſtaliſation*: and theſe are drawn either (1) from the *juices* of Plants that are *not at all acid*; and thoſe *Salts* are ſometimes *alkaline*, ſometimes *nitrous*, and all of them may be *diſſolved* in the Air into a *liquamen*, and flow: or (2) from the *juices* of *acid* Plants; and theſe are more *terreſtrial*, and almoſt of a *tartareous* nature: the Doſe of them is from ʒjv to ʒvj *in Broth.* It muſt be obſerved alſo that the greateſt *power* of Plants conſiſts in theſe *Salts*; whence they are called *Eſſential.* (β) The *Salt* which uſes to adhere to the ſides of the Veſſels, in which the *juices* of Plants *ferment*, and is called Tartar: and this is an *acid Salt*, not flowing in the Air; and it's Cryſtals are called *Cremor Tartari*, the *Doſe* of which is from ʒß to ℥j *in broth*; moreover that *eſſential Salt* of Wine operates by the power of it's own *Acor*, namely by *ſtimulating* the Inteſtines; but it never enters the Lacteal Veſſels, for it cannot be *diſſolved*, but by ſome very ſtrong *Alkali*, a vehement *ebullition*, and plenty of *Water*; as experience ſhews: therefore it can neither be diſſolved by our *Lymph*, nor by our *Heat*, ſo as to enter the Veſſels; nay and the difficult *ſolution* of this *Salt* appears from this, that if we ſuffer the *Water* when it has *boiled*, to be cooled, and a little evaporated, the *cream* will ſwim at top, and the reſt which is more *fix'd* will gradually ſubſide, till all the *Salt* has forſaken the *Water*. 2. *Artificial fix'd Salts* of Vegetables; and theſe are extracted from the aſhes of burnt Plants; and are of *two* ſorts, namely, (α) Thoſe which are obtained from Plants burnt with a *ſlow Fire*; and they are not very *acrid* or *burning*, becauſe they have a little mixture of *Oil:* moreover they are eaſily diſſolved, and ſo will enter the Lacteal Veſſels, unleſs they are hindered by the abovementioned *regimen:* the *Doſe* of them is from ʒj to ʒjß. (β) Thoſe which are extracted from Plants burnt with a *ſtrong Fire*: and theſe are all *corroſive*; and therefore ought to be taken in a large quantity of *Water*; their *Doſe* is from *gr.* jv. to ʒß. 3. All *native foſſil Salts:* for thus *marine Salt* taken to the quantity of ℥iij performs the office of an *Eccoprotic*, provided the before-mentioned *regimen* be obſerved; for otherwiſe, if it be taken in a *warm* Bed, or in *Air warmed* to the ſame degree of *heat* with a Bed, it becomes *diuretic*, and in a ſtill greater *heat*, excites a *diaphoreſis*; for it is eaſily *diſſolved* by our humours, and enters the Lacteals: the ſame may be ſaid of *Borax*, *Sal Gem*, and *Sal Ammoniac*, which are taken to ℥ß; alſo of *Nitre* and *Alum*, the *Doſe* of which is ʒj, and of *Vitriol*, which being taken to ʒj provokes *vomiting*; but if you take *gr.* vj, it is *cathartic*, eſpecially if it be calcined to *whiteneſs*.

(δ) All *hard*, *ſharp* and *rigid* Bodies alſo, which cannot be digeſted, are to be accounted *Eccoprotic* Medicines which act by ſtimulating: ſuch as *filings* of *Steel*, *&c.* alſo *Antimony*; for this conſiſts of *ſtimulating* and *rigid* parts, whoſe *ſtimulating* power and *rigidity* cannot be deſtroyed by any Menſtruum; and thus they draw out the Liquid from the Inteſtinal Glands by their *Gravity* and *Figure:* hither alſo belong all *rough Bodies*, as *Bones* and *prickles* of Animals; and thus *Eels* boiled with their *ſpines* are ſwallowed by ſome to cauſe a *Purgation:* alſo all *Stones* of Vegetables, as of *Grapes*, *Elder-Berries*, *&c.* *purge* by ſtimulating; alſo the *Cadavera*, as they are called, of *boiled* Vegetables, as any *Pot Herbs* boiled, ſuch as *Spinage*, *Lettuce*, *Endive*, *&c.* of which as the *laſt* Solids cannot be *diſſolved*, they become *ſtimulating* by their *rigidity*.

(ε) LASTLY to this Claſs of *Eccoprotics* muſt be referred all *Soaps*, both *natural* and *artificial*; ſo far as they *act* by *ſtimulating*, whether they are taken by the *Mouth*, or applied *below* in form of a Suppoſitory, Clyſter or Fume; and indeed of theſe *Fumes*, the beſt is that which is made of Tobacco, Coloquintida, or both together, for example,

℞ *Fol. Tabaci Braſil.* ℨj *vel* ℨjß.

Colocynth. gr. jv.

Comburantur ſimul, & fumus per idoneam Fiſtulam in Rectum Inteſtinum injiciatur.

TAKE *of the Leaves of Braſilian Tobacco, a Dram or a Dram and half, of Coloquintida, four Grains. Burn them together, and let the Fume be thrown up the Fundament, thro' a convenient Pipe* (*a*).

COR. I. THE Medicines of this third Claſs, that is, the *ſtimulating*, are of ſervice or diſſervice to all thoſe, to whom the Remedies of the firſt and ſecond Claſs are *beneficial*, or hurtful.

COR. II. MOST of the Medicines which are deſcribed in the *firſt*, *ſecond* and *third* article of this third Claſs, are good in all Inflammatory Diſeaſes.

(*a*) Conſult TH. BARTHOLIN. *Hiſtor. Anatom. & Med. Centur.* 6 *Hiſtor.* 66. where alſo there is a *Scheme* of a *Pipe* proper for this operation. See alſo SYDENHAM *Sched. Monitor. de novo febr. Ingr. p. m.* 502. [See alſo STISSER *de Machinis Fumiductoriis curioſis*, where the Reader will find deſcriptions and figures of Inſtruments proper for this purpoſe.]

A GENERAL COROLLARY belonging to the *three* Claſſes together.

ALL theſe *Eccoprotics* agree only in a *ſtuffing* and *infarction* of the *great* Guts, eſpecially of the *Colon.* Moreover it is to be obſerved in this place, that Women of a *ſpare* and *lean* habit of Body, who are apt to be *coſtive*, eſpecially after Delivery, often become *languid* and *melancholy*, labouring under a moſt obſtinate and miſerable *obſtruction* from an *indurated* matter in the *Colon*: and this *hardneſs* in that Place is ſufficiently evident to the touch, and by the unſkilful is ſometimes taken for the *Placenta*, and ſometimes for the Spleen; when in reality it is only the *obſtructed* matter ſtopping in the *large* Guts: whence it cannot be moved by any Medicines except *Eccoprotics*: for if *ſtronger Purges* are given to Women in this caſe, dreadful Symptons are immediately excited, as *Vomitings*, *Colic*, and *hyſteric Paſſion*: Wherefore at that time *Eccoprotics* are to be thrown up in form of a Clyſter, to remove and expel the *infarction*. Theſe Medicines alſo are of ſervice to ſome *melancholy* Artificers, as alſo to all ſtudious Perſons, whoſe Abdomen is uſually much and frequently compreſſed (*a*). Laſtly *Eccoprotics* are of the greateſt ſervice in removing all *Diſeaſes* of the Liver and Spleen, *&c.* ariſing from *obſtruction.*

CHAP.

(*a*) Becauſe whilſt they are intent on their Studies, they uſually ſit with their *Bodies bent*, and ſo *compreſs* the contents of the Abdomen. Conſult alſo *Rammazini de Morb. Artificum, Cap. de Literat. Morb.* and alſo Dr CHEYNEY's *Treatiſe of Health and Long Life, pag.* 221. *Edit. Now.*

CHAP. V.

Of Phlegmagogues.

1. PHLEGMAGOGUES *are thoſe which expel the pituitous Lymph out of the Body by the Anus.* Now the *Pituita* is a certain *tenacious* and *viſcid* Matter, like that *Mucus* which flows out of the Noſtrils of a healthy Man in the morning.

2. The origine of this *Pituita* is *twofold.* 1. It oftentimes ariſes in the *firſt Paſſages*, namely from a *viſcid Food*, in thoſe whoſe Bowels are ſo *weak*, that they cannot contract themſelves with ſufficient force, or in whom the Bile and Pancreatic Juice have contracted a *fault*, ſo that they cannot perform their *Office* of attenuating, and preſerving the *Chyle* from coagulating. 2. The *Pituita* often ariſes from a Liquid that is not *pituitous*; as from the *Spittle*, and *Mucus* of the Palate, Gullet, Stomach and Inteſtines; all which *Liquids* are *aqueous*, but yet have ſome parts that eaſily *coaleſce*. The *Pituita* moreover ariſes from theſe Liquids *two* ways. (α) If thoſe humours are deprived of their *moſt liquid* part by the power of *heat*; thus, for example, our Liquids are inſpiſſated in burning Fevers; for experience teaches us, that if our Liquids are expoſed to the ſame *degree* of *heat*, as *that* of a Body infected with a burning Fever, they will ſoon be inſpiſſated. (β) The Fluids alſo of our Body are inſpiſſated by *ſtagnating*; for unleſs theſe Liquids are moved and agitated, they ſoon *run together*, the *moſt liquid* part of them being flown off, whence Inſpiſſation ariſes.

3. As it appears from the *mechanical* ſtructure of the human Body, that the Secretory Veſſels are far *leſs* than the Blood Veſſels, (concerning which ſee CHAP. V. PROLEG.) therefore the *moſt fine* Liquids only can be ſeparated by them, and indeed much *finer* than the Blood: therefore the *Pituita* which is *tenacious* and *thick* is not immediately *ſecreted* from the Blood: for what the ignorant believe and ſay of the *thick Mucus*, that it is *ſecreted* from the *Glands* of the *Pituitary* Membrane, ſuch as it appears, is not at all true; for if this Membrane, being *contracted* by cold, is inflamed, as happens in a *Coryza*, then it will *ſecrete* an *aqueous* and *limpid* humour, which the next morning after the Man has ſlept, and the Nerves have been at reſt, will become a *thick Mucus*, being rendered ſuch by *ſtagnating*. There are not therefore any Veſſels, which ſecrete ſuch a *Pituita*, præ-exiſting in the Blood; whence indeed it follows, that there are not any ſuch Medicines, as may draw down from the Secretory Veſſels this *Pituita*, præ-exiſting ſo *thick* in the Blood; therefore it remains to enquire, what are true *Phlegmagogues*.

4. THE Medicines which ought to be diſtinguiſhed by the Name of *Phlegmagogues*, are *twofold*. 1. Thoſe which draw down the Matter apt in it's own nature to *coaleſce*, from the Blood by the Inteſtines. 2. Whatſoever expel the *viſcid Matter* contained in the Inteſtines. Every *Phlegmagogue* therefore acts either upon the Inteſtines, orupon the *Pituita* itſelf; but that this may be drawn out, it muſt be rendered fit to *flow*; and this is obtained either by dividing the *Pituita* by ſome *acrid* Body, and at the ſame time by adding ſome *more fluid Liquid*; or by increaſing the *Motion* of the Solids by means of ſome *Stimulus*, ſo that the *Pituita* may be *ground* by them.

I. The firſt Claſs of *Phlegmagogues* contains thoſe which draw out the *Pituita* by *diluting* it: ſuch are, 1. *Fair Water* drank warm, or thrown up in form of a Clyſter, provided the Air be *cool*, and the Patient walk gently, for he muſt take care not to *ſweat*, and if it be taken at the Mouth, the Stomach ſhould be *empty*. 2. Water with *ſaponaceous* Bodies; as Water mixed with *Honey*, drank warm with the above-mentioned *regimen*; and this greatly *reſolves*, for if there is a *coagulum* of the Blood, *fair* warm *Water* gently *diſſolves* it, but that mixed with *Honey* does it *ſooner*; the ſame alſo is *done* by Water mixed with *Caſſia* and *Manna*, alſo with *Venice Soap*, that which is called *Soap* of the Philoſophers, and the natural *Soap* of Animals, that is the *Bile*. 3. *Saponaceous Gums*; that is, *viſcid* Bodies, which are *ſoluble* in Water, and in ſome meaſure *acrid*: ſuch are, *Aloës*, *Gum Ammoniac*, *Aſſa Fœtida*, *Bdellium*, *Galbanum*, *Myrrh*, *Opopanax*, *Sagapenum*, *Native Turpentine*, *&c.* But theſe are taken *diſſolved* in warm *Water*; for by this means they *operate* much better. 4. *Warm* Water with all the *vegetable* Salts which are enumerated in the *third* Claſs of *Eccoprotics*, except the *acid* Salts, as *Tartar* and ſuch like. 5. Whatſoever are contained in the *ſecond* and *third* Claſs of theſe Medicines.

II. The ſecond Claſs of *Phlegmagogues* includes thoſe which operate ſo far as they excite the inteſtinal *Fibres* into *motions*, by the help of which the *Pituita* being *preſſed* and *ground*, is divided into various parts, and being divided is at laſt ſqueezed out: ſuch are all *viſcid Acrids*, that are not too *volatile*; for theſe Bodies in which the *Acrid* is ſo entangled by other parts, that tho' *they* are diſſolved, yet *it* cannot be ſeparated from them, but remains fixed to the place, to which thoſe parts are applied;

and therefore can neither *exhale*, nor *penetrate* into the Lacteal Veſſels: of this kind are all the *Viſcids* enumerated in the *preceding* Claſs: hither alſo belongs *Oxymel*, than which nothing is better to diſſolve the *Pituita*; alſo *Elixir proprietatis*, if it be thickened with *Honey*; *Tinctura acetoſa* with the moſt acrid Aromatics; *Hiera picra* GALENI; all the *purging Gums* enumerated in the *third* Article of the firſt Claſs; *mild Mercurials*; as *Mercurius dulcis* taken in a *cool* Air, for it ought to be determined downward, to avoid a *ſalivation*; *Mercurius ſublimatus* taken in a *very ſmall* quantity, as in the *doſe* of $\frac{1}{20}$ part of a grain; *Antimony*, with a very little *Nitre*, as gr. xv. of *Antimonium diaphoreticum*; all *emetic* and vehemently *ſtimulating* Medicines taken in a *ſmaller* doſe. Beſides there are other *Phlegmagogues* which are called *officinal*; and all theſe act by *ſtimulating* the Fibres, by means of ſome *volatile Acrid* which is very *ſtimulating*, but is entangled and reſtrained by *viſcous* parts; ſuch are, 1. *Agaric*, which is a *fungus* growing to the *Larch-tree*: the *ſmalleſt* doſe of this *crude* is gr. x. the *largeſt* ʒij, and ſometimes ʒiij in robuſt conſtitutions; but if it is boiled in Water, and then the juice is expreſſed and ſtrained, the doſe may be *doubled*; but being put into Spirit of Wine, it is diſſolved juſt like *Sperma Ceti*: the doſe of this *extract* is then ℈ij; but it is ſo ſwelled and dilated like a ſponge, that a *Tincture* can ſcarce be drawn from it: well taſted *Agaric* has at firſt a *ſweetiſh* and *viſcid* taſte, but leaving ſom thing *acrid* behind, and at laſt very *bitter*; whence it appears, that it's *power* is plainly *ſtimulating*. 2. Seeds of *Carthamus*, or *Baſtard-ſaffron*; the doſe of which is from ℈j to ʒiij, but if it be taken in *decoction*, the doſe muſt be doubled: but if they are taken *in ſubſtance*, they cauſe vehement *gripings*, with a *ſwelling* of the Abdomen; hence they uſe to be *corrected* with Ginger, Galangal, Aniſe, Cardamom, *&c.* by which *Flatuſes* are diſcuſſed: they have alſo a taſte which at firſt is *viſcid* and *ſweetiſh*, but afterwards *acrid* and *nauſeous*. 3. *Coloquintida*, which is a ſort of Cucumer: this fruit being deprived of it's ſeeds and dried, forms a vehemently *purging* medicine, which is preſcribed under the name of *pulpa Colocynthidos*; it has a moſt violent *bitterneſs*, but very *viſcid*; and by it's *viſcoſity* eaſily *adheres* to the Inteſtines: and ſo great is it's *Acrimony*, that it may cauſe *death*: hence it was called by the name of *death* by the Sons of the Prophets, *Kings* II. *c.* iv. *ver.* 40. The doſe of *Coloquintida* in ſubſtance is from gr. iv. to ℈j; but it is not *given* without danger, for it excites *gripings* and *violent purgings* and produces *Ulcers* in the Inteſtines, and ſometimes even fetches Blood (*a*); the beſt *Menſtruum* for it is *Water*, by the help of which an *Extract* is made (*b*); the doſe of this is the ſame as if it was given *in ſubſtance*, and the *effect* of it is no leſs powerful, and without ſuch horrid gripings; but the *Extract* made with Spirit of Wine is of more ſervice in *cold* and *pituitous* Bodies: this was the *Arcanum* of MARTINUS RULANDUS, under the title of *Spiritus vitæ aureus*, ſo called from the colour which it gives (*c*);

(*a*) For which reaſon it is not given by the *more cautious* Practitioners to thoſe who have *weak* Bowels, who alſo obſerve, that the *pulpa Colocynthidos*, when given in *Clyſters*, is to be wrapped up in a *nodule*, and the *decoction only* is to be uſed; for fear the moſt ſubtile *pieces* of it ſhould bring on and leave behind them the moſt horrid Gripes. See FULLER *Pharmac. Extemp. pag. m.* 113.

(*b*) Eſpecially if this *Water* is firſt altered with a little quantity of *tartareous Alkali*. Conſult LUDOVICUS *Pharmac. Cap. de Purgant. Vegetab pag. m.* 58.

(*c*) Conſult RULAND. *Curation. Empiric. Centur. II. cap.* 96. or TENTZEL. *Exegeſis Chymiatr. apud Ang. Salam. p m,* it's doſe was to ʒij, or ʒiij, *ſweetened* with ſyrup: he uſed to add *Cloves*, or ſomething of that ſort, that the *diſguiſe* might not be diſcovered; and this *Tincture* being inſpiſſated and exſiccated affords a *reſin*, the doſe of which is from gr. iv. to viij. 4. *Euphorbium*, which is the juice of a Plant with a tricoccous ſeed, very much reſembling our Spurge: this *Gummoſo-reſinous* juice is pale yellow, and burns the Tongue with a fiery *Acrimony* that endures a long time; it is exceedingly *viſcid*, and therefore adheres very tenaciouſly to the Inteſtines, and cannot thence be removed and diſſolved, but by Spirit of Wine and Spirit of Salt: it *purges* in an *exceeding ſmall* doſe, as of gr. ß. though ſometimes a doſe of gr. xii. has been preſcribed by bold Empirics. In Perſons eaſy to be moved, it firſt abrades the *mucus* of the Inteſtines, and then fetches Blood; but it is of moſt *ſervice* to hydropical Perſons, in whom the force of it is very much broken: it may be diſſolved in *Water*, but then it has ſo horrid a taſte, that it is not fit to be uſed this way; moreover if it is *diſſolved* in Spirit of Wine, which extracts it's moſt *ſpirituous* and *reſinous* part, leaving the *terreſtrial* part behind, it acquires a *greater* force; and therefore the greater doſe of it is to be reduced to gr. iv. but if it is boiled with *Vinegar*, it's whole *force* is loſt. 5. *Hermodactyl*; this is a gummy root, which being chewed renders the Spittle viſcous, and has a *bitter* or *nauſeous* taſte: it's doſe *in ſubſtance*, is from gr. x. to ʒij, but if boiled in *Water*,

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p. m. 637. M. BOULDUC has given an account of the Analyſis of *Coloquintida*, by Diſtillation, by Fermentation with *Muſt*, by Digeſtion, and by Extraction. See the *Memoirs of the Royal Academy of Sciences, for the Year* 1701, *p. m.* 12. From this Analyſis he concludes that to be the beſt Extract, which contains both *gummy* and *reſinous* parts, provided the *mucilaginous* particles, which cauſe an irritation, are ſeparated by long Digeſtions, tending to Fermentation.

Water, it may be given in a *double* doſe: in Alcohol of Wine only the *reſinous* part is drawn out, and in *common* Spirit of Wine a Body is extracted, which is compounded with *reſinous* parts. 6. *Jalap*; this is the root of a plant called *Marvel of Peru*, which bears ſuch numbers of flowers, that are diſtinguiſhed with ſuch a variety of colours: if it is chewed *entire*, it firſt fills the Mouth with a *ſlime*, but ſoon after exulcerates the *Fauces*; being *ſwallowed* ſlowly, it *burns* in a manner the Tongue, *Fauces* and Gullet; but this diſorder may be corrected by *Vinegar:* it's doſe *in ſubſtance* for children, chiefly againſt the *Worms*, is to gr. viij. or gr. ix. and the *greateſt* doſe for grown Perſons is ℈ iv. *(d)*, which ſeldom fails, unleſs there is much *acid* in the Stomach; for *Acids* deſtroy it's *power:* if boiled in *Water* the doſe is to be *doubled*; but it operates *ſooner* this way, and gripes leſs: but *Honey*, *Sugar*, or ſomething of that ſort ſhould be added to it, to keep it from exulcerating the *Fauces:* moreover if the *ſlices* of this root are boiled with a ſufficient quantity of common Spirit of Wine, an *Extract* is obtained, conſiſting of *oily*, or *reſinous* and *ſaline* parts, the doſe of which is the ſame as *in ſubſtance:* but being *diſſolved* in Alcohol, and inſpiſſated, it affords a *reſin* of which ℈j. is equal to ʒj. of it *crude*. 7. *Mechoacana* which is a ſpecies of *Bryony*, whence alſo it uſes to be called *Bryonia alba*; this works more mildly than *Jalap:* it is a *gummy* root, of a *viſcous* and *acrid* taſte: it's doſe is from gr. xij. to ʒjß. but it is diſſolved no leſs than *Jalap*,

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[*(d)* The doſe here aſſigned is much larger than is given in *England*, the common doſe being ʒß, which I have ſeldom known to fail, even in robuſt Conſtitutions. Whether the Conſtitutions of our learned AUTHOR's Countrymen require ſo large a doſe of this *Phlegmagogue*, or whether it is a miſtake of the Editor, I ſhall not take upon me to determine.]

Jalap in Water and Spirit of Wine. 8. Some *Plumbs* called *Myrobalans*, becauſe they are *viſcous*, and like *Acorns:* there are various *ſpecies* of them, diſtinguiſhed according to the *difference* of their native place, colour, or ſize; but there are *five kinds* of them in the Shops, contained in theſe two verſes;

Myrobalanorum ſpecies ſunt quinque bonorum,
Citrinus, Chebulus, Belliricus, Emblicus, Indus.

All theſe *Fruits* are *viſcous* with an *earthy, aſtringent* and *acrid* taſte; hence they *purge* pretty vehemently, but afterwards *bind*; they are very *ſower*, and not eaſily *ſoluble:* the doſe of them *in ſubſtance* is to ʒij, in *decoction* to ℥jß, in *infuſion* to ℥ij. 9. *Gamboge*, which is an *aromatic* Indian Gum; it expells a matter like the *mucus* of the Noſtrils: it's doſe is from gr. iß. to gr. x. Being diſſolved in the *Yolk of an Egg* or *Honey*, it acquires a *double force*; for the Menſtruum, by interpoſing it's ſelf between the *viſcous* parts, gives an exit to the *Acrids:* the leaſt part of it only is *diſſolved* in *Water*, but that which is *diſſolved* acts vehemently enough (*e*).

10. *Gummy*

(*e*) *Gummi Gutta* or *Gamboge,* which has other names alſo, for which the Authors may be conſulted, *purges* Children very well in a *doſe* of gr. iß or gr. ij. with *Sugar*, but for grown Perſons gr. jv. or gr. vj, are required; if it is given in a larger *doſe*, it generally *works* very violently both *upwards* and *downwards*. But though this Gum is endued with ſo great *Acrimony* yet the Fruit of the Tree, whence it proceeds, is *ſweet* and *eatable*; for it is ſaid that the Inhabitants of *Cambodia, eat* it as we do an Orange. See more of this Gum in the *Memoirs of the Royal Academy of Sciences*, where M. Boulduc relates various *experiments* made by him concerning the *preparation* of it. And the *hiſtory* of it may be read particularly in Clusius *Libr.* 4. *Exoticorum, cap.* viii. and then in Bontius, *de methodo medendi Indica, cap.* ix. and above all in the Hortus Malabaricus, *Tom.* I. *page* 41. Conſult alſo Lottichius *Tract. de Ghitta Jemou.*

10. *Gummy Turbith:* this is a ſort of *gummy* bulb or root; it is called *gummy*, becauſe, if it is *chewed*, it affords a *viſcoſity* like *Gum* with a mixture of a *bitter Acrid:* the doſe *in ſubſtance* is from gr. x. to ℈ij. the *decoction* in Water to ʒj. operates gently, but if it is *diſſolved* in *common* Spirit of Wine, it becomes a *clyſſus* containing Water, Oil, and Salt, and operating *mildly*; if it is diſſolved in Alcohol, it becomes a very *purging reſin:* ſo that it does not much ſignify, what way it is prepared. Theſe, except *Gamboge*, were the *Phlegmagogues* of the Ancients, together with *Opopanax* and *Sagapenum.*

BUT the Moderns have added *Manna*, alſo *Aloës:* *Manna* is a viſcous Body, endued with ſome *Acrimony*; but *Aloës* in it's viſcoſity and bitterneſs imitates the Bile, which Bile is eſteemed by HIPPOCRATES as a *natural clyſſus.* The doſe of *Aloës* is from gr. ij, or gr. iij. to j, *Bryony* alſo is added to theſe; which is a thick, fungous root, very pituitous, and having an *acrid*, biting, and nauſeous taſte: it's doſe *in ſubſtance* is from ℈ß to ʒj, and in *infuſion* to ℥ij, or more. This Root boiled in Water, or Beer, draws out the *Pituita* ſlowly, but with vomiting and virulence, but it's taſte *in decoction* is intolerable; but being boiled in Spirit of Wine and inſpiſſated, it acquires a *double* force: but it is good for Women whoſe *Menſtrua* are ſuppreſſed by a *Pituita* affecting the Womb. The root of *Polypody of the Oak* operates alſo by the *power* of it's viſcoſity and acrimony.

MERCURIALS alſo belong hither, and in the firſt place *Mercurius Dulcis*; which if it be finely *levigated*, becomes a *Sialogogue*, but if groſsly powdered, is a *Phlegmagogue*; for it is not eaſily *diſſolved* in *Menſtruums:* the doſe of it is from gr. ij. to ℈jß.

COROLLARIES

Tending to the ſolution of Phlegmagogues.

As all the *Phlegmagogues* here mentioned conſiſt of a viſcous part, which is either gummy or reſinous, and have a penetrating, but *inviſcated* volatile Salt, the following Corollaries relating to the ſolution of them may be formed.

I. If a Body, in which neither the ſaline nor the gummy, nor the reſinous part prevails, be *diſſolved* in Water, that which remains after the *ſolution*, will retain the *purging faculty*, tho' at the ſame time the *purging faculty* is communicated to the Water. Moreover if that reſidue is put into *common* Spirit of Wine, what remains in that alſo will be *purgative*. But if this ſecond reſidue be *diſſolved*, as far as it can, in Alcohol of Wine, then what remains will be *unactive*, like a *Caput mortuum*, and therefore not purgative.

II. If a Body in which the ſaline predominates, be *diſſolved*, as far as it can, in Water, then the reſidue will be *unactive*; as it happens in Bodies that are not reſinous but gummy, as *Agaric* and *Bryony*.

III. If a Body ſhall be half ſaline and half reſinous, and be diſſolved, as far as it can in *common* Spirit of Wine, then what remains will be no leſs unactive.

IV. But if only the reſinous part prevail, then all it's *purgative* faculty will be extracted by Alcohol of Wine, and the reſidue will be *unactive.*

V. If the three *ſolutions* mentioned in the *firſt* Corollary are mixed, and inſpiſſated with a ſlow Fire, we ſhall obtain the *entire forces* or *quinteſſence* of the diſſolved Body.

VI. All theſe Extracts kept in the open Air, yield a *nauſeous* ſmell, on the ceaſing of which, their virtue periſhes, but the *weight* remains.

VII. All theſe being boiled with *Acids*, as with Vinegar, Oil of Vitriol, Spirit of Nitre, Spirit or Oil of Sulphur by the Bell, *&c.* looſe their power.

Practical COROLLARIES.

I. The *uſe* of the Medicines here explained, is neceſſary in Perſons whoſe *firſt Viſcera*, or Organs which make the *Chyle*, are weak. Theſe *Organs* are of *two* ſorts; (α) the Mouth with it's inſtruments of *maſtication*, and the Stomach with it's *digeſting* Muſcles, and the Stomach with it's *comrpeſſing* Muſcles. (β) The Diaphragm, as it communicates it's motion to them all, the *abdominal* and *pectoral* Muſcles, and the *motion* of the Arteries and Liver.

II. The *uſe* of *Phlemagogues* is very neceſſary in all diſeaſes, that ariſe from a *Chyle* vitiated by the *ſluggiſhneſs* of the Bile; for the Bile is a *menſtruum*, by the efficacy of which the *viſcidity* of the food is eaſily ſubdued and reſolved: therefore when it is too *ſluggiſh*, or flows too *ſparingly* into the Inteſtines, the *Pituita* and *Phlegm* are in a ſhort time generated and grow in the Inteſtines; whence Perſons affected in this manner are rendered *hydropical* or *pituitous*; they receive benefit therefore by *Phlemagogues*, in a ſmall, but often repeated doſe. They agree alſo chiefly in all *cold diſeaſes*, ſuch as depend on an *inactivity* of the *firſt Bowels*, and of the *Menſtruums*; from which *two faults* ariſe *white Tumours* called *Leucophlegmatic*, alſo *infarctions* of the *Abdomen*, the *Dropſy*, *Green-ſickneſs*, *&c.*

III. *PHLEGMAGOGUES* are of ſervice to thoſe, who have a *paleneſs* of the whole Body, a *viſcidity* of the Spittle, Pancreatic and Inteſtinal Juices, and whoſe excrements are in a manner covered with *Pituita.* For it muſt be obſerved, that *redneſs* of the Body depends on *redneſs* of the Blood, and this on the *circulation* through the Veſſels, and eſpecially the pulmonary, in which the *leaſt* particles are violently compinged by the *reſiſting force* of the Veſſels againſt the *impelling force* of the Heart; whence it comes to paſs that they are formed into *ſolid* and *round Moleculæ*, which are therefore *red.* Therefore if a *paleneſs* overſpreads the Body, we know from the nature of the diſeaſe, 1. Either that the Veſſels are too *lax*; 2. Or that the Blood is deficient; 3. Or laſtly that the Heart does not contract it's ſelf with ſufficient force, and therefore that the *power* of the Solids on the Fluids is *diminiſhed:* for when this *force ceaſes*, immediately the Blood grows pale, as we find by experience; for the *red* Blood being drawn out and at reſt, ſoon *grows pale*, and is *reſolved* into a *pituitous* Serum. Hence therefore *Phlegmagogues*, which *dilute*, *reſolve* and *ſtimulate*, are of great ſervice in this caſe; becauſe they take away the *defect* of *motion* in the firſt paſſages, on which the *defect* of the Heart moſt depends.

IV. *PHLEGMAGOGUES* are good for thoſe, who, from too *ſedentary* a life, or too *viſcid* a food, as wholly on *farinaceous* ſubſtances, either not at all or not duly fermented, become *pale* and *pituitous.*

V. THE beſt method of *curing* the diſeaſes enumerated in the *four* preceding COROLLARIES is this: 1. Let the Body be *prepared* for ſome Days, by giving ſuch things as *ſtimulate* the Bowels, and *dilute* and *reſolve* the *Pituita*; ſuch as thoſe which were mentioned in the ſecond, third, and fourth article of the *firſt* Claſs, where I treat of Soaps, and fetid Gums, and of thoſe which conſiſt of Waters and artificial, that is, fixed alkaline Salts. 2. Let the matter being *diſſolved*, and made very *fit* to flow, be expelled by the *Phlegmagogues* deſcribed in the *ſecond* Claſs. For example, let us ſuppoſe a Man to be of a *cold*, *pituitous* and *ſluggiſh* conſtitution, and to live upon *crude* aliments that are not eaſily diſſolved, whence we are afraid he ſhould ſoon fall into a Dropſy; then the *cure* ought to be attempted after the following manner: (α) let him take every hour gr. ij. of *Venice Soap* reduced into Pills; and after each of theſe Pills, from gr. v. to gr. x. of *Nitre*, or GLAUBER's *fixed Salt*, or *fixed Salt of Tartar*, or *Pot-aſhes*, or *Gum Ammoniac*, in *white Wine* or *Mint-water*: (β) after the *uſe* of theſe Medicines for ſome Days, let him take every evening *one Pill* of *Aloës*, to gr. iij, or gr. iv. and the next morning a like *pill* with gr. ß or gr. j. of *Euphorbium*: by this method the Patient will ſoon be cured.

VI. LASTLY it appears from what has been ſaid, that innumerable diſeaſes may be cured by *Purges* rightly applied; notwithſtanding the *opinion* of HELMONT and other Chemiſts his followers, who ſay, that every *Purge* is a *Poiſon*, and therefore always weakens our *Body* (*f*).

(*f*) Compare HELMONT, lib. de Febribus, cap. v. integr. & alibi paſſim.

CHAP.

CHAP. VI.

Of CHOLAGOGUES.

1. BEFORE I explain the true *nature* and *effect* of *Cholagogues*, and enumerate the Claſſes of them, I ſhall weigh the *opinion* of the Ancients concerning them. The Ancients acknowledged *two* ſorts of Bile; the one *black* or *ſplenic*, and the other *yellow* or *hepatic*, and ſo called the Medicines that *purge* the firſt, *Melanogogues*, and thoſe which *purge* the latter, *Cholagogues*; by this laſt name they called all thoſe Medicines, and thoſe only, which expelled *excrements* reſembling the *Cyſtic* Bile in it's *yellow* colour and other properties: by which means they fell into *two* errors; (α) They excluded from the number of *Cholagogues* ſome Medicines that are truly *Cholagogues*, namely ſuch as move the *Hepatic* Bile ſtrictly ſo called: for this Bile if examined in the *Sinus Gliſſonianus*, before it is mixed with the *Cyſtic* Bile, plainly reſembles *Lymph*, in taſte, ſmell, colour, and tenacity; and therefore though it be drawn out by the help of *Cholagogues*, yet the *excrements* do not owe their *yellow* colour to it. (β) They often took ſome for *Cholagogues*, which really are not ſo, as will preſently appear: for as the *Cyſtic* Bile is diſtinguiſhed from all other Liquids of the Body by *theſe four* characters; 1. By it's *bitterneſs*, 2. By it's *yellowneſs*, 3. By it's ſhining *brightneſs*, 4. By it's *thickneſs* and *tenacity*; hence from the preſence of the *three* laſt characters in the *excrements*, the Ancients concluded them to be bilious, for as they did not uſe to taſte the *excrements*, they could ſay

nothing of the *firſt*; and therefore they called all Medicines *Cholagogues*, that expelled ſuch *excrements*: but this was raſh and erroneous; for this *yellowneſs* and ſhining *brightneſs*, which ſometimes are obſerved in *viſcid excrements* expelled by *Cathartics*, may be the *creature* of the Medicines themſelves, which ſtain the *contents* and chiefly the *mucus* of the Inteſtines with a ſhining *yellow*, though there is not the leaſt quantity of Bile in them: for thus *Caſſia*, taken in a ſmall quantity, tinges the *urine* and *excrements* with a *yellow* colour, which therefore is falſly aſcribed to the Bile; and if taken in a larger quantity, it makes them *green*, and if in a ſtill larger, *black*; nay the *excrements* will become *yellow*, by taking *Manna*, and alſo *Tamarinds*, by which they become *pituitous* alſo; nay and *Aloës* diſſolved in a large quantity of Water, grows very viſcid, and imitates the Bile, and ſometimes *tinges* the *excrements* with a yellow colour.

2. FROM what has been ſaid it appears, how much the Ancients erred, when from the *effect* which ſome Medicines have of expelling *excrements coloured* like Bile, they concluded that they really *purged* the Bile. Therefore rejecting the *opinion* of the Ancients, I ſhall reduce all *Cholagogues* to *two* Claſſes; of which the *firſt* contains whatſoever promote a more plentiful *ſecretion* of the Bile, by attenuating the *hepatic* Blood; but the *latter* includes all thoſe, which by violently *ſhaking* the Diaphragm and Abdomen derive the Bile from the Liver and Gall-bladder into the Inteſtines, whence afterwards, if there be occaſion, it may be drawn out of the Body by *Stool*.

UNDER the *firſt* Claſs are contained all *natural Soaps*: ſuch as the juices of all ſeaſonable ripe fruits, which have a mixture of ſweet and acid; as of

Grapes,

Grapes, *Cherries*, *Mulberries*, *Elder-berries*, *&c.* of *Raſp-berries*, *Black-berries*, *Apples*, *Pears*, *&c.* for theſe melt every thing that ſtops in the Veſſels, and conſequently the Bile, and that ſometimes ſo vehemently and copiouſly, as to bring on a *Cholera Morbus.* Hither alſo are above all to be referred, 1. The *juices* of ſome Plants that are manifeſtly *ſaponaceous* ; as the juice of that ſpecies of *Lychnis*, which is known by the name of *Soapwort :* hither alſo belong *Caſſia*, *Manna*, *Honey*, *Sugar*, *Tamarinds*, *juice of damaſk Roſes*, *Aloës*, *Scammony*, *Myrobalans*, *Rhubarb.* 2. *Artificial Soaps*, which conſiſt of Oil and Salt combined by *art*, as was ſaid before, and of which there are *various* ſpecies enumerated above; but the beſt of all is *that* which is compoſed of a volatile alkaline Salt, and a volatile Oil. Laſtly, hither are referred *Elixir proprietatis*, and all moderately *aromatic ſyrups*, as FERNELIUS's *ſyrup of Mugwort*, *ſyrup of Botrys*, or *Oak of Jeruſalem*, *ſyrup of the five opening Roots*, *ſimple ſyrup of Succory*, *ſyrup of Succory with Senna*, *ſyrup of Violets*, *&c.* let all theſe be taken in *whey*, or in a *decoction* of Dandelion, or other ſuch like *diluent*, and that in the morning on an *empty* Stomach.

THE *latter* Claſs contains all the *ſtronger Emetics*, ſuch as *leaves* of *Aſarabacca* ; alſo *Emetics* of *Antimony*, *Mercury*, *&c.*

Practical COROLLARIES.

I. THE Bile ought never to be *evacuated* ; for it never offends in *quantity*, unleſs in thoſe who have abſtained from *food* too long ; in which caſe nothing elſe is required, but to take *food.*

II. THESE Medicines are to be applied in all *diſeaſes*, which ariſe from an *obſtruction* of the Hepatic,

Hepatic or Biliary Duct, and conſequently in the *Jaundice*; but yet with ſome caution; for in the beginning of the *diſeaſe*, we ought to abſtain from the *ſtronger* Medicines; for they increaſe the Fever, or rather the inflammation from which the Fever ariſes: but the *Jaundice* often proceeds from an *infarction* of the Liver, by cretaceous, gypſeous, calculous, and other concretions; and ſometimes from an *obſtruction* of the common Duct, by the ſtopping of a *little ſtone*, which is always accompanied by an *enormous vomiting*. This *diſeaſe* alſo generally effects ſtudious Perſons, becauſe of their *ſedentary life*; and the following method ſeems to be the beſt way of *ſubduing* it. 1. Take daily one Pill every hour, made of *Venice Soap*, or of a ſmall quantity of *Aloës* with Honey, or of *Hiera Picra* in a ſmall doſe; or take *Sal Polychreſtus*, with a little *Honey* and *Smegma* of *Rhubarb*, and drink ſome ſmall *liquor*, ſweetened with Sugàr, Honey, or *ſyrup of Violets*, with a *ſtrict* diet; and continue the *uſe* of theſe or ſuch like 'till the concretions begin to be *reſolved*; which for the moſt part happens in one or two *Months*; and may be known to be effected, by the *change* of colour in the *Urine*, *Stools*, and *Skin*. Then, 2. Let them take *ſtrong Emetics*, by which the Abdomen may be violently ſhaken, and the *diſſolved* matter ſqueezed out; but theſe are not to be preſcribed at the beginning, leaſt, by driving out the moſt fluid part, they render the concretions more hard and fixed; when the operation of the *Emetic* is over, let them take an *Opiate* in the Evening, and accuſtom themſelves by degrees to exerciſe, and *thicker* food. But the *diſeaſes* which ariſe from a *defect* of Bile may be cured by adminiſtring ſuch things as are eaſily *diſſolved*; as Ptiſans, yolks of Eggs, and ſuch like, together with a Pill of *Soap*.

CHAP. VII.

Of HYDRAGOGUES.

1. *HYDRAGOGUES are Purging Medicines, which draw out Water, that is, the ſalivoſe inteſtinal Serum.* Now every Liquid ſecreted from the Blood, which is neither *fat* nor *red*, is called *Serum:* it either is *concreted* by the Fire, like the white of an Egg, into a hard maſs; and of this kind is the *Serum* of the Blood properly ſo called: or not *concreted*, but *exhaling*, and leaving thick *Fæces*, but not coagulated; ſuch are Spittle, Sweat, Urine. But the *Serum* which is drawn out by *Hydragogues*, is of the *latter* ſort. Moreover it is called *Inteſtinal*, becauſe it is derived into the Inteſtines, and that *two* ways; 1. It diſtills from the *ſalival Glands* of the Mouth, and alſo from the Glands of the Palate and Gullet, and is ſwallowed down: 2. It is ſecreted and flows into the Inteſtines, not only from the Inteſtinal *Glands* themſelves, but alſo from the *Glands* of the Liver through the Hepatic Duct. Now this *Liquid* is drawn out by means of *Hydragogues* in a much greater quantity than naturally, and is expelled by the *Anus*.

2. BUT *Hydragogues* may be reduced to *three* Claſſes; of which the *firſt* contains thoſe which promote the *ſecretion* of this *Liquid*, by ſtimulating the Glands of the Inteſtines. The *ſecond* contains thoſe which ſtir up the *Secretion* of the ſaid *Liquid*, 1. By diſſolving the Blood into parts that are not red; 2. By moving it more quickly when ſo *diſſolved*, that it may be applied in a greater

quantity to the *ſecretory Glands* of the Inteſtines. Laſtly, the *third* includes thoſe *Medicines* which do *both* together.

Of the firſt Claſs of Hydragogues.

THE Medicines of this Claſs being applied to the inner *Membrane* of the Inteſtines raiſe them up into *Bladders* after the manner of a Veſicatory, which they afterwards *diſſolve* by their *cauſtic* power, whence follows a continual *dropping* of Inteſtinal Tears. For the whole ſurface of the Body, both *external* and *internal*, abounds with Veſſels containing the aforeſaid Liquor: but if to theſe Veſſels *acrid* Bodies are applied, which are able to *diſſolve* them, and at the ſame time are ſo *thick*, that they cannot enter them, then they will draw out that Liquid; and they will be called *Veſicatories*, or *Hydragogues*, as they are applied to *this* or *that* ſurface, *internally* or *externally*: wherefore all *acrid Veſicatories*, which are ſo thick that they cannot enter the Lacteal Veins, become *Hydragogues*, without any exception; and the more *acrid* and *thick* they are, the *ſtronger* they are. Moreover the Medicines of this Claſs ought to have *two* conditions; for 1. It is neceſſary that they contain ſomething *thin*, *acrid*, *corroding* and *burning*: 2. That this *burning* part be ſo *involved* in ſome gummy or reſinous Body, that the whole does not exhale *at once*, but *ſucceſſively*; whence alſo it will *corrode ſucceſſively*. The Medicines of this kind are *twofold*; being taken either from Foſſils or Vegetables. Thoſe which are taken from Vegetables are the following: 1. The Root of *Mechoacanna*, which has been enumerated already amongſt the *Phlegmagogues*: it has much the ſame *powers* with *Jalap*; being diſſolved in Alcohol it affords a *tincture*, which being inſpiſſated becomes a *reſin*; if this *tincture* is held in the Mouth, it gives an intolerable heat to the *Fauces*, and excites a *Salivation*; but if it is ſwallowed, it inflames the *Fauces* and *Gullet*, and fills them with humours; thus alſo it's *reſin*, if it be chewed, vehemently moves the *Spittle*, and exulcerates the Mouth; laſtly, if it be applied, with the white of an Egg, to foul Ulcers, it abſterges them: the doſe of this Root is from ℈j to ʒij which indeed is a larger doſe than was required for the intention of a *Phlegmagogue*, becauſe in this caſe the *Stimulus* ought to be *ſtronger.* It is a moſt noble *Hydragogue*, but it ought not to be ſwallowed, without being wrapped up in ſome *viſcous* Body, to keep it from injuring the *Fauces* and Gullet. 2. *Jalap*; this, if chewed, ſeems at firſt to be *ſluggiſh*, but at length is found to be *very acrid*: it's *tincture* made with Alcohol, and held in the Mouth, exulcerates alſo the *Fauces*; but the *reſin* being chewed raiſes an intolerable pain and ſwelling, and greatly promotes the ſecretion of the *Saliva*: moreover if it be taken diſſolved in Water, it *purges* vehemently, as alſo it's *tincture* ſweetened with Sugar. The doſe of it *in ſubſtance* is from ℈j. to ℈v, but of the *Reſin* from gr. v. to ℈j. 3. *Ebulus* or *dwarf Elder*; of this we uſe the *Fruit* and the *middle Bark*: the doſe of the *Berries* is from ℈j. to ʒv. the *juice* of them and of the *tops* is uſually given from ℈ß to ℥j. The *middle Bark*, if it be given to ℈ß to Infants, and to ℥ß to Adults, brings off the *Serum* powerfully, and acts more ſtrongly than *Elder*: but the *Berries* and *Bark* of *dwarf Elder* give an acrid and hurting taſte. 4. *Buckthorn*, which is commonly called *Rhamnus Catharticus*, or *Spina Cervina*, and by ſome *Spina Infectoria*, becauſe it is uſed by Painters (*a*); the expreſſed

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(*a*) The *unripe Berries* are called *yellow Berries*, and the juice of the *ripe Berries* inſpiſſated is called *Sap-green.*

expreſſed juice of it's Berries is taken to ℥j, and when boiled into a *Syrup* to ʒij. This *ſyrup of Buckthorn*, according to SYDENHAM's obſervation is of the greateſt ſervice to hydropical Perſons, and from thoſe who are eaſily purged it draws off Water very plentifully *(b)*. But the *juice* being held in the Mouth gives a ſort of fiery taſte. 5. *Sea Bindweed*, or *Soldanella minor* ; this is a maritime Herb, and a ſpecies of *Convolvulus* : it is eſteemed among the maritime *Hollanders*, as a divine Medicine ; it has a very hot taſte of Salt : it is uſed in *ſallads*, but it's force is very much abated by *Vinegar* ; it is a muddy and tenacious Herb, with ſome acrimony, and *purges* the *Belly* with gripings : it's doſe is from ℈j. to ℥ß. 6. *Gratiola* or *Hedge Hyſſop* ; this has a fiery and very bitter taſte ; it purges *Water* with violent gripings, and commonly provokes to *vomit* : it's doſe is from ℈ß to ʒij *in infuſion*, 7. *Iris Noſtras* or *German Flower-de-luce* ; this acts moſt vehemently ; the doſe of the Root *in powder* is from ℈ß to ʒjß, *in infuſion* from ʒj, to ℥ß. but the doſe of the *juice* recently expreſſed is from ℥ß to ℥iij. and if it is not given with caution it raiſes *bliſters* on the Gullet with violent pain ; but this pain is taken away by *Vinegar*. 8. *Eſula* ; the juice of which, as to it's colour and conſiſtence, is like *Milk*, but it is ſo *burning*, that being applied to the Skin, it exulcerates it like Fire ; and is ſo *tenacious*, that being evaporated by a gentle heat, it turns to a *reſin*. MARTINUS RULANDUS had in *Germany*, a certain *Arcanum* for the Dropſy, and cured almoſt all that came to him in great numbers ; this *Arcanum* was the *cortex Eſulæ* boiled in *whey*, and

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(*b*) Conſult SYDENHAM, *Tract. de Hydrop. p.* 493, *edit. in quarto.*

and ſweetened with *Honey*: the doſe of *Eſula* is from gr. iij. to gr. viij. *in ſubſtance*, but *in infuſion* that doſe muſt be doubled; hither alſo are referred the other ſpecies of *Tithymalus* or Spurge, as alſo *Euphorbium*. 9. *Gamboge*, of which I ſpake in the CHAPTER of *Phlegmagogues*: ſome will have this Plant to be a ſpecies of *Euphorbium*, which being wounded yields this *juice*, and that the *yellow* colour is added to it, to *diſguiſe* it: but being taſted it exulcerates the *Fauces*, and adheres to them moſt tenaciouſly, and excites *bliſters*; it is alſo a very ſtrong and good *Hydragogue*; it's doſe is from gr. iij. to gr. xv. but it generally cauſes a *vomiting* in Bodies that are hard to be moved. 10. *Elaterium*, or the juice of the *wild Cucumber* inſpiſſated by the Sun; this is a *very acrid* Medicine, and alſo ſo *viſcous*, that it will remain *tenacious*, though it be kept one hundred years: it is commended by SYDENHAM as the *laſt refuge* in a Dropſy (*c*): the doſe of *Elaterium* is from gr. j. to gr. xij. and it is a moſt vehement *Purgative*.

THE *Hydragogues* of this *firſt* Claſs which are taken from Foſſils, are the following. 1. *Mercurius dulcis*, which conſiſts of the *Acid* of Sea Salt and of *Mercury* concentrated or recondited; this is an excellent *Hydragogue* if groſsly powdered; for it is not eaſily diſſolved by our Liquids, and therefore, whilſt it ſticks in our Inteſtines, it *ſtimulates* them by the power of the *Acid*, which is contained in it, it's doſe is from gr. jv. to ℈ij. and it draws out the *Water* violently; but if finely levigated, it cauſes a Salivation, and if being groſsly powdered, it is applied to a Wound, it excellently corrodes the *Calluſes* which grow at the edges.

2. *White*

(*c*) *Tract. de Hydrop. page* 494. Conſult alſo LISTER *de Morbis Chronicis, Tract. de Hydrop. page* 17, *ad* 20. *Edit. Ludg.*

2. *White Precipate*, the power of which conſiſts in *acid ſpiculæ*, which are not hidden, but are open and naked; whence if they are broken by *Alkalines*, and ſeparated by the *power* of Fire, it becomes *ſweet:* it's greateſt doſe is gr. xij. and it purges vehemently. 3. *Red Precipate*; which acts ſtill more violently, wherefore it's doſe is from gr. ij. to gr. v. 4. *Yellow Precipitate*; it is an excellent *Hydragogue*, but is to be given with caution, for otherwiſe it excites a *Salivation:* it ought therefore to be given under the four rules already laid down; that it may be determined toward the Inteſtines, and that it be taken without any other Medicines, by which it may be *derived* to the *habit* of the Body, ſuch as *Diaphoretics* and *Opiates:* but it alſo corrodes Ulcers, and conſumes ſuperfluities, even in the moſt obſtinate *Calluſes*, but not without pain: Paracelsus called it *Turbith Mineral*, becauſe it purges the Lymph after the ſame manner with the *Vegetable Turbith*, which was thought to draw it even out of the inmoſt joints of a *gouty* Body: the doſe of *Yellow Precipitate* is from gr. ij. to gr. vj. To theſe may be added, 5. *Green Precipitate*, the doſe of which is the ſame as of the *yellow:* Hither alſo are referred, 6. *Chryſtals* of *Metals*, as (α) *Vitriol of Silver*, of which the *Lapis infernalis* is made; the doſe of it is from gr. $\frac{1}{6}$ to gr. iij. (β) *Vitriol of Copper:* both theſe *Vitriols* violently diſcharge *Water*; the doſe of the *latter* is about gr. j. To this Claſs alſo may belong *Filings of Copper*; which is extolled as a *ſacred Anchor*, both by antients and moderns: by this Medicine Charles V. was cured of a Dropſy, ſee Forestus; the doſe of theſe *Filings* is gr. vj. (γ) *Vitriol of Steel:* the doſe is from gr. vj. to ℈j. In the laſt place, 7. *Common*, or *white Vitriol:* the doſe is from ʒj. to ʒiv.

Coroll. All theſe Medicines operate only by their Acrimony; and therefore not by any *ſpecific virtue*: for that this is the caſe, is proved by, 1. Their moſt acrid *taſte*; 2. The *heat* which they cauſe in the *Fauces*; 3. The *bliſters* which all of them raiſe, not excepting Jalap and Mechoacanna. 4. The *pain* which they cauſe, when applied to the Wounds. 5. The *Chemical Analyſis*; for if any of them are diſſolved as much as poſſible in *Water* or *Spirit of Wine*, they communicate *moſt acrid powers* to their Menſtruums: but that, which remains untouched and undiſſolved, has no *powers* at all.

Of the ſecond Claſs of Hydragogues.

The Medicines of this Claſs are thoſe which *diſſolve* the Blood into a *ſerous* Liquid, and *move* it more ſwiftly when ſo *diſſolved*; that it may be applied in greater plenty to the Inteſtinal Glands. To effect *both* theſe, it is neceſſary that the Medicines ſhould be *mixed* with the maſs of Blood: and leſt any one ſhould think that ſuch *Purges* are never *mixed* with the Blood, we ſhall confirm this aſſertion by a *threefold* argument. 1. *Infuſions* of *Crocus Martis*, *Senna* and *Rhubarb*, being injected into the cavity of the *Thorax*, in Men and Brutes, cauſe *dejections* by *Stool*, in *England*, *France*, and *Italy*, in half an hour; and therefore I do not doubt, but that they were received into the Veins. 2. *Mercury* being rubbed into the Feet, to excite a *Salivation*, often cauſes a *Diarrhœa*, unleſs it is reſtrained by *Diaphoretics* and *Opiates*. 3. The *cure* of any *ſerous flux* through the Belly is ſucceſsfully performed by the help of *Diaphoretics* and *Opiates*.

In this Claſs moreover we know only *one* Medicine, namely *Mercury*: for this, whether given *crude*, or made into *Mercurius dulcis*, being taken in a ſmall doſe, and often repeated, and under the four rules mentioned above, brings on a *ſerous flux*, after two or three days.

Of the third Claſs of Hydragogues.

To this Claſs belong all the Medicines of the *firſt* Claſs, which both ſtimulate the *Glands*, and increaſe the *Secretions*, and alſo *diſſolve* the Blood, and move it when ſo diſſolved: for as *Cantharides* being applied *externally* to the Skin raiſe *bliſters*, and at the ſame time ſo *diſſolve* the Blood, as ſometimes to cauſe *bloody* Urine, ſo alſo all *Veſicatories* and *Acrids*, ſuch as thoſe which are enumerated in the *firſt* Claſs, being *internally* applied to the Inteſtines, produce *bliſters* in them alſo, and at the ſame time *diſſolve* the Blood, and derive it thither.

Practical COROLLARIES.

I. *HYDRAGOGUES* agree in all diſeaſes, where a *ſalivoſe Lymph* abounds in the Blood: and ſuch are all thoſe diſeaſes, in which the firſt *Viſcera* are *weak* and *ſtuffed* up; whence the parts of Aliments cannot be ſo *attenuated*, as to enter into the Lacteal Veſſels, and be mixed with the Lymph: ſuch alſo are all the diſeaſes in which the *contractile power* of the Heart and Arteries is *weak*, whence the Blood becomes too *thin*; for it is manifeſt from Natural Philoſophy, that the *ſtronger* the *force* of the Heart and Arteries is, by ſo much is the Blood *more thick*, and on the contrary, that it is the *thinner*, as that *force* is the *weaker*; for thus in Perſons who uſe much labour, as in Plowmen, Porters, and ſuch like, the Blood is ſound to be very much *compacted*

pacted; but in *tender* conſtitutions, and all thoſe whoſe *Viſcera* are weak; as in the Leucophlegmatic, Phthiſical, Scorbutical, *&c.* it is quite *watry*.

II. The ſame Medicines are of ſervice in every *extravaſation* and *ſtagnation* of the humours; and therefore in every Oedematous Tumour, and Contuſion.

III. They are of ſervice alſo in thoſe diſeaſes in which a *ſudden ſolution* or *evacuation* of the Liquids is required; and therefore in *Fiſtulas*, the Itch, all ſorts of Dropſy, the Apoplexy, which often ariſes from *Serum extravaſated* in the cavities of the Brain, *Gonorrhœa virulenta*, and ſuch like.

IV. As often as theſe Medicines are to be adminiſtred, they ſhould be given the firſt time in a doſe ſufficiently *large*; for otherwiſe, as they are *cauſtic*, they will greatly *ſtimulate*, and not *evacuate* at all; whence dreadful anxieties and gripings will ariſe.

V. *HYDRAGOGUES* are hurtful in all *inflammatory* diſeaſes, whether the *Inflammation* be in the Arteries, or in the Lymphatic Veſſels; and therefore they are *hurtful* in all Fevers, unleſs *bleeding* has preceded.

VI. They are *hurtful* alſo to Hypochondriacal and Hyſterical Perſons; for they often are ſo violently purged by *Hydragogues*, as to fall into *lowneſs of Spirits* and *faintings*.

VII. Any *Hydragogues* whatſoever eaſily cauſe a *Super-purgation*. Now a *Super-purgation* is of *two* ſorts; the *firſt* ſort is cauſed by Medicines that are too *evacuating*, namely when the velocity and tenuity of the humours are ſo *increaſed* by the *Medicines* that the *excretory Veſſels* are thereby diſtended beyond their *tone*, and become *paralytic*; whence it comes to paſs, that they cannot *contract* themſelves, but remain *open*, and conſequently the humours *flow out* in greater quantity than is fitting. The *cure* of this *diſorder* is beſt attempted by the ſtrongeſt *Aſtringents* with *Opiates* and *Spirits:* for all *Spirits coagulate*, as we learn from *Chemiſtry*; therefore *auſtere* and *ſpirituous* Bodies are always to be uſed in this caſe. The *laſt* ſpecies of *Super-purgation* is the *ſpaſmodic*; ſuch as HIPPOCRATES has deſcribed, as ariſing from *Hellebore* (*d*); for the *Spaſms* give a violent ſhake, and thence the humours are expelled. On this occaſion it is beſt to give *mineral Acids*, together with *Opiates*, and warm *Aromatics.*

(*d*) *Aphor. ſect.* v. *Aph.* 1. and 4, alſo *Libr. de Veratri uſu*, *art.* 7, alſo *Coac. ſect.* iv. *verſe* 24. Conſult alſo DURETI *Enarratio* on this place, *Lib.* III. *Tract* iv. *art.* 17.

CHAP. VIII.

Of MELANAGOGUES.

1. THE Ancients reckoned there were *two* ſorts of black *Bile*. The *firſt* from the Spleen, which was called the *melancholy humour*, the *dregs* and *recrement* of the Blood; and they affirmed that the ſubſtance of this was *melancholy* Blood. The *latter* from the Liver, which was called *Bilis hepatica exaſſata*.

2. THEREFORE the Medicines which were called *Melanagogues* by the Ancients were, 1. Thoſe which *purge* the *atrabilious humour* from the Spleen through the Inteſtines; now that this may be done, was ſaid before, and at the ſame time the *way* was aſſigned, by which *that humour* paſſes; and there-

fore in this caſe they were not miſtaken. 2. Thoſe which carry off the *hepatic Bile*; but if we conſider attentively, we ſhall ſee, (α) that there are many *purging* Medicines, which render the excrements *black*; for thus *Polypody of the Oak*, which is reckoned a principal *Melanagogue*, following the nature of all *Oaks*, the property of which is to tinge almoſt every thing with a *black* colour, ſtains the Mucus of the Inteſtines *black*; and therefore is called a *Melanagogue* by the Ancients: and thus alſo *Lapis Armenus* and *Lapis Lazuli*, as alſo *black Hellebore*, *Dodder of Thyme*, and *Senna*, were accounted *Melanagogues* by them; but now it is well enough known, that thoſe two ſtones tinge the *excrements* with a very black colour, as alſo all *Vitriols*. 2. That ſometimes by the *power* of nature alone, without the adminiſtration of any *Cathartic*, the *black* matter is ejected both upwards and downwards: in which caſe any thing may be called a *Melanagogue*, that expels this matter *kindly*, for it ought not to be treated *roughly*, but only to be moved by gentle *Purgatives*.

COROLLARIES.

Of Purges in general.

I. The whole human Body may be *depurated* by the *belly*; though HELMONT affirms the contrary: now to *depurate* is to *ſeparate* ſome parts of a *determinate Texture* and *Acrimony*; by which properties they differ from the *reſt* of the Blood, with which they are *circulated*: moreover theſe parts are generally *leſs* than the particles of *Blood*; and therefore if we can *diminiſh* the *laxity* of the Excretory Veſſels in the Spleen, Liver, and other Bowels, and *increaſe* that of the Expulſory Canals, it readily appears, that thoſe *peccant* parts may eaſily be *ſeparated.*

II. *PURGES* are not *Poiſons*, as PARACELSUS affirmed, and HELMONT endeavoured to prove by theſe arguments (*a*); namely, 1. Becauſe in an *increaſed doſe*, they always occaſion death. 2. Becauſe *Venice Treacle* which reſiſts Poiſons, helps to take off the *power of Purgatives.* But to theſe I anſwer, 1. That not only *Purges*, but whatſoever are moſt *ſalubrious*, if taken in *too large a quantity* are *mortal.* 2. That the *Venice Treacle* ſtops the *purgative force* of a Medicine by the power of the *Opium* which it contains; for this ſtops all *contractile motions* of the Solids for the preſent; whence there is a *ſmaller expulſion* of the Liquids by the Secretory and Excretory Veſſels.

III. THERE are no *elective Purges*, that is, which expel the Bile, Lymph, and *Pituita*, leaving the *reſt untouched*: for this has abundantly appeared from the hiſtory of *Purges*: for when we were conſidering them *ſpecially*, we plainly ſaw, that they act *equally* on all our Liquids, but that *matter* only is moved, which is moſt eaſy to *flow* and be *diſcharged.*

IV. THE *powers* of *Purges* are falſly deduced from an *Acid*, an *Alkali*, or ſome inherent *Sulphur*: for the *juice* of Vegetables, and Spirit of Nitre, *purge*; in which however there is no *Sulphur*: but every *Acrid*, that is able to *ſtimulate*, on this very account becomes a *Purgative.*

(*a*) See HELMONT, in the *place* before *quoted.*

CHAP.

CHAP. IX.

Of Emetics or Vomitories.

1. BY *Emetics* we underſtand *all thoſe Medicines, by the power of which the contents of the Stomach are thrown upwards, through the Gullet into the Mouth.* The immediate cauſe of *vomiting* is the *compreſſion* of the Stomach upon the contents: now this *compreſſion* may ariſe either from the *contraction* of the Fibres of the Stomach it's ſelf; or from an *external* cauſe ſtrongly *preſſing* the ſides of the Stomach; or laſtly from *both* together.

2. HENCE therefore there are *three* ſorts of *vomiting*. The *firſt* is a violent *evacuation* of the Stomach by the *upper* parts, procured by the *contraction* of the Fibres of the Stomach it's ſelf. To this ſort are required, 1. A *fitneſs* for *expulſion* in the matter to be expelled; that is, a *fluxility*. 2. A cloſe *ſtricture* of the Pylorus, and an *opening* of the upper Orifice. 3. A *diſtenſion* of the Stomach, and a *contraction* ſucceeding it, which depends on the Fibres of the Stomach acting together. This ſort of *Vomiting* was acknowledged by the Ancients, and that it does ſometimes happen, tho' ſome Moderns deny it (*a*), who will have all *vomiting* to ariſe from a *convulſion* of the Muſcles of the Abdomen, is manifeſt from this, that if the Body is bent when the Stomach is full, there will preſently ariſe ſome *eructations*; which are cauſed only by the opening of the

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(*a*) In the firſt place the famous CHIRAC, who was the Author of this opinion, and alſo the celebrated DU VERNEY. Conſult the *Hiſtory of the Royal Academy of Sciences*, for the *Year* 1700, *page m.* 27.

the *upper Orifice* of the Stomach, and not by any *convulſion* of the Diaphragm and Abdominal Muſcles.

3. And thus Vomiting is uſually cauſed by the following; 1. Any *topical Acrid* applied to the Stomach. 2. Any *inflammation* of the Stomach; as happens in *malignant* diſeaſes and the Small-Pox, alſo in taking Poiſons: but yet not becauſe the Stomach, in a ſtate of *reſt*, or whilſt it is *flaccid*, is moved to *vomit* by the *inflammation*, but only when ſomething is *taken in.* 3. A *Schirrus* in the Stomach. 4. A *too great* and *ſudden repletion* from any ſubſtance. 5. An *inordinate motion* of the Animal Spirits excited by any thing *nauſeous*, or by any other cauſe; hence hypochondriacal and hyſterical *Spaſms* uſually excite a *vomiting*. 6. A *Spaſm* of the Stomach from an *unuſual motion* of the Body; as going in a coach, ſailing, turning round, &c. 7. A *ſympathetical Spaſm* of the Stomach, as in *wounds* of the Head, Apoplexies ariſing from an extravaſated Liquid, Cholic, *Nephritis*, &c. which *Spaſm* ariſes from a communication of the *Nerves* of the Stomach with the *Nerves* of the *affected parts*; whence alſo it comes to paſs, that *vomitings* accompany almoſt all diſeaſes of the *Abdomen*.

4. The ſecond ſort of vomiting is that which happens from the *compreſſion* of the ſides of the Stomach by the *Muſcles* of the Abdomen; for theſe are ſometimes ſo *drawn together*, that all the Bowels contained in the Abdomen are ſtrongly *preſſed*; wherefore, if at that time the *upper Orifice* of the Stomach be opened, a *vomiting* will neceſſarily enſue. But in this ſort of *vomiting*, the cavity of the Abdomen is greatly *ſtraitened* by it's proper Muſcles, the Diaphragm and *Peritonæum* acting together; whence the Blood is very much

compreſſed in the whole Abdomen; and hence the *Secretions* are chiefly made in all it's contained Bowels; nay and ſometimes the Blood-veſſels in the Liver *burſt* aſſunder, whence dreadful *ſymptoms* ariſe: thus alſo the Blood, being driven violently towards the *upper parts*, by the *compreſſion* or *reſiſtance*, which it endures in the lower Belly, ſometimes produces an *Hæmoptyſis*, and ſometimes an Apoplexy. Beſides in this *compreſſion* of the Abdomen, if the *force* of the *Sphincter* of the Anus be ſo great, as to be *inſuperable*, the *periſtaltic* motion of the Inteſtines is ſometimes inverted, and thence an *iliac Paſſion* ariſes; but if that *force* be *overcome*, then an *excretion* is made at the ſame time *downwards*, in which not only the contents of the Inteſtines are excluded, but alſo the *Liquors* which are ſecreted and flow from all the *Bowels* of the Abdomen: but this ſort of *vomiting* uſually follows the firſt ſort continued too long; for the *Nerves* of the Stomach being *vellicated*, at laſt the Muſcles of the Abdomen are alſo *drawn together*, by the *conſent* of the *Nerve* of the eighth pair.

5. THE third ſort of *vomiting* is that which ariſes from the *contraction* of the Fibres of the Stomach, and of the Muſcles of the Abdomen at the ſame time; here alſo the *vomiting* is moſt violent.

COROLL. THAT almoſt univerſal *error* therefore of Phyſicians is to be expunged, that the action of *Emetics* cannot be explained, without firſt deſcribing the *coats* of the Stomach; and this is inculcated by thoſe, who derive *vomiting* from the *motion* of the Stomach only: which how precarious and foreign from the Truth it is, appears not only from what has been ſaid, but from this alſo, that if any Poiſon happens to touch the beginning of the intercoſtal pair of *Nerves*, a *vomiting* immediately enſues. Whence we may doubt, whether theſe *Emetics* which do not produce their *effects* 'till after ſome hours, do not firſt act on the Brain, and then *diſturb* the Stomach by *conſent ?*

6. Now the following are the common *cauſes* of the *three* ſorts of *vomiting :* 1. Thoſe which *vellicate* more *ſtrongly ;* as a *Feather* turned about in the *Throat.* 2. All that *diſturb* the Animal Spirits, though they do not *act immediately* on the Stomach ; as *unuſual motions* of the Body. 3. Nauſeous *Ideas.* 4. A moveable *ſubſtance fluctuating* in the Stomach, being alſo *acrid* and *vellicating.* 5. Any *Acrid* taken into the Stomach, in *tender* conſtitutions. 6. Any *Purges*, either in *too large* a doſe, or given to *tender* Perſons. 7. *Acrids* mixed with the Blood ; as *infuſion of Tobacco*, in which if Children be waſhed, to cure them of the *Itch*, for which it is of great ſervice, they will be ſeized with a *vomiting ;* thus alſo *infuſions* of *Crocus Metallorum*, Hellebore, glaſs of Antimony, *&c.* in *Water*, *Wine*, or *Milk*, if they are injected into the Veins, produce firſt a giddineſs, then a *ſtaggering*, then a *nauſea*, and at laſt a *vomiting.* But if *Emetics* are injected in form of a *Clyſter ;* they have no ſucceſs, except in thoſe, who have a *laxity* of the *Valvula* TULPIANA, as is uſual in *weak* Perſons.

7. *EMETIC* Medicines may be reduced to the five following Claſſes.

I. THE *firſt* Claſs contains all Bodies that are known to us, which enter the Stomach in ſuch a quantity, as to *fill* it too much, and *diſtend* all it's Fibres, and compel thoſe of the *Back* into *contraction ;* by which it comes to paſs that the *Pylorus* is *conſtringed*, whence a *nauſea* and *vomiting* ſoon follow ;

follow; hence alſo even Water *drank* copiouſly and haſtily, nay and Wine, Beer, and any ſorts of meats may by this means become *Emetics.*

II. The *ſecond* Claſs contains all Bodies which ſo *relax* and *lubricate* the *Fauces*, Gullet, Stomach, or Inteſtines, that the *contents* of the Stomach are thereby thrown *upwards* with the leaſt motion: ſuch are any *Fats*, taken often and in great quantity, provided they be not *acrid*; as *Oil*, ſweet, new, thick *beer*, *mead*, *ſyrups*, *lyes*, *ſoaps*, *beer* with *butter.*

III. The *third* Claſs includes *mechanical Applications*, which by *irritating* the *Fauces*, *drive* the Fibres of the Stomach and neighbouring parts into *contractions*: for Willis has demonſtrated that the *Fauces*, Lungs, Heart, Intercoſtal Muſcles, Stomach, Diaphragm, and Meſentery have *Nerves* from the *ſame origine*; hence alſo if the *Nerves* of the *Fauces* are *irritated*, all the enumerated parts are eaſily *convulſed:* thus if the *Finger* or a *Feather* be put into the *Fauces*, or if the Tongue be preſſed down, a *nauſea* will preſently be excited, and if this be continued, a *vomiting* will ſucceed.

IV. The *fourth* Claſs contains whatſoever *act topically* on the Stomach it's ſelf, by *irritating* it at the very point of time when they are ſwallowed: ſuch are, 1. *Gilla Vitrioli* Paracelsi; if this be taken from ℈ij. to ʒj, it ſoon cauſes a vomiting. 2. *Verdegris*; the doſe of which is from gr. ß. to gr. ij. and this works almoſt as ſoon as taken. 3. *Tincture of Tobacco*, drawn with rectified Spirit of Wine from the leaves of the common Tobacco, a little dried; which being given to ʒj. or ʒij. immediately provokes to *vomit*; but if it be diluted with *Water*, then the *operation* of it may be *ſtopped* at pleaſure: but in thoſe who are *uſed* to chew Tobacco it will have no ſuch effect. 4. The *juice* of *Wormwood* or *Cardus benedictus* recently expreſſed: the doſe is from ʒj. to ℥iij. 5. *Oxymel of Squills:* the doſe is from ℥j. to ℥jv. 6. The *juice* of *Horſe-radiſh* recently expreſſed; which loſes it's *powers*, unleſs it be taken within an hour: the doſe is from ℥j. to ℥ij. 7. *Radiſh-ſeeds* contuſed: the doſe is ʒß. 8. The *root* of *Orach*, and alſo it's juice recently expreſſed: the doſe is from ℈j to ʒj. 9. *Peach bloſſoms*; the *ſyrup* of which is uſually preſcribed to Infants, as far as ℥j. 10. The freſh *juice* of *Quinces*; which being taken to one ſpoonful is an immediate *Vomitory*, though it ſtops a *vomiting* ariſing from a *relaxation* of the Fibres of the Stomach. 11. *Seeds* of *Dill*; the doſe is from ʒij to ʒß. but they leave a long *nauſea* behind them. 12. The *juice* of *Sow-bread*; which is uſed *externally* in the *Ung. Arthanitæ.* Moveover the above-mentioned Medicines *act* in the ſame manner on the Stomach, as a *feather* does on the *Fauces*; for they *irritate* and *vellicate*. But the *uſe* of theſe agrees with thoſe who eaſily *vomit*, who have a pretty *ſenſible* Stomach, and who are prone to *vomit*, and apt to *nauſeate* from mere *repletion*. From theſe alſo may be choſen ſuch Medicines as conduce in *acute* and *chronical* diſeaſes; among theſe we have Bitters, Acids, and Aromatics.

V. The *fifth* Claſs contains all thoſe which being communicated to the Blood bring on univerſal Spaſms, but chiefly exert themſelves in the Stomach and Inteſtines. Now the Medicines of this kind are ſuch as ſtay an hour or more in the Blood before they act; ſuch as, 1. *White* and *black Hellebore*, the *former* of which is not ventured upon by diſcreet Phyſicians, on account of the violent *Spaſms* which it brings on; for being given to ℈ß it acts moſt violently: but the *black* is given to ʒj. 2. Leaves of *Aſarabacca*; the doſe is from v. to x.

in number, either in ſubſtance, or in infuſion. 3. *Gamboge:* the doſe is from gr. jv. to gr. xij. in a ſpoonful of Wine. 4. *Gummy Turbith:* the doſe in ſubſtance is from ℈j to ℈ij, of the *reſin* from gr. vij to ℈ß. of the *extract*, which is the beſt of all, from gr. xv, to ℈j, of the *infuſion* from ʒij to ℥ß. 5. *Cataputia major*, either *root* or *ſeed:* the doſe is from ℈j to ʒj, but it operates very violently. But all theſe may be ſo mitigated and tamed by *Acids*, as to have no force remaining in them (*a*). 6. *Mercurials*; as *Turbith mineral*, *white*, *red*, and *green Precipitate*, *&c.* 7. *Antimonials*, as *Crocus*, *Regulus*, *Glaſs*, *Flowers*, *ſulphur* of *Antimony*, *Mercurius Vitæ*, *&c.* and eſpecially *Emetic Tartar*, which is the moſt ſafe of all, and moſt in uſe; the doſe of it is from gr. ij to vj. But all theſe being digeſted with Oil of Vitriol loſe their *power*. Moreover theſe violent *Emetics*, if they are immediately injected into the venal Blood, are *venomous*

(*a*) There are yet ſome other *Vomitories* taken from the Vegetable Kingdom; as the leaves of *Gratiola:* the doſe is from ℈j to ℈ij. Of *Sedum Vermiculare:* the doſe is ʒß. Alſo the *firſt leaves*, *catkins*, and *buds* of *Elder*, and *dwarf Elder* or *Danewort*; but beyond all theſe is that noble root *Ipecacuanha*, which the Moderns have diſcovered, and brought into uſe with very great ſucceſs; for being reduced into a fine *powder*, and given from ℈j to ʒß, it affords a *mild* and excellent *Vomitory*; it is uſually given in *broth*, or in a *bolus*, and is uſed by ſome in *infuſion*, and in *decoction* As for the *hiſtory* and *virtues* of this Braſilian root, conſult the modern Authors, eſpecially Piso, *Hiſtor. Natural. Braſiliæ*, *Lib.* iv. *cap.* 53. *edit. ſecund.* Alſo the *Dictionaries* of Pomet and Lemery; alſo Dale, *Pharmacolog. ſupplem. page m.* 148; and Juncker, *Conſpect. Therap. page* 33; and Tournefort *Traité de la Matiere medicale*, *&c. Tom. I. page* 438, *& ſeq.* For the *virtues* alſo and *uſes* of the root *Ipecacuanha*, ſee the elder Helvetius, who firſt made the uſe of it famous, *Traité des Maladies*, *&c. Tom. II. page* 271. *& ſeq. edit. ult.* For the *chymical Analyſis* of it conſult Boulduc in the *Hiſtory* and *Memoirs of the Royal Academy of Sciences*, *for the year* 1700, *Hiſt. page m.* 46. and *Memoir. page* 1, *and* 76; and *for the year* 1701. *Mem. page* 190.

venemous and *mortal*: for their *powers* in this caſe are ſufficiently ſhewn by WILLIS's Experiment; "for when he had cauſed ſome Wine impregnated "with the *infuſion* of *Antimony* to be injected to the "quantity of ℥vj. into the jugular Vein of a ſtrong "Dog, after about five or ſix minutes the Dog began "to *reel*, and *ſtumble*, as he went long, and then to "*vomit* grievouſly. But we may imagine, ſays the "Author, that this *effect* was produced by the "*Medicine*'s attacking the Brain rather than the "Stomach; ſince a like *vomiting* has often ſucceeded an application of a *Liniment* or *Fomentation* of the juice or decoction of *Tobacco* to the "head." (*b*). Beſides it may be worth while to obſerve, that in *Greece* and in the *Helleſpont* there is a *Poiſon*, with which *ſwords* are infected, the wounds inflicted by which, are always mortal, on account of the horrid *Spaſms* which they occaſion; but the obſervation of the Moderns, and the confeſſion of Drunkards has diſcovered this *Poiſon* to be the *juice* of *Hellebore*, gathered in *Greece* and in the *Helleſpont*.

Theoretic COROLLARIES.

I. IT is not yet demonſtrated, whether the ſtronger *Purgatives* and *Emetics* produce *excretory Spaſms* as being *immediately* applied to the Stomach and Inteſtines; or as being applied to the *origine* of the Nerves? But it is obſerved in *vomiting*, that all Excretions, ſuch as *ſweat*, *ſtools*, *tears*, *ſpittle*, &c. are no leſs promoted, than by *paſſions of the mind*, or by ſome body *mechanically* affecting the *origine* of the Nerves.

II. HENCE therefore it appears, that the ſtronger *Vomitories* act on the *origine* of the Nerves.

III. HENCE

(*b*) WILLIS *Pharmaceut. Rational. part I. ſect.* 1. *cap.* *page* 54 and 55. *edit. Haganæ.*

III. Hence alſo appears the reaſon, why amongſt Medicines, only *Poiſons*, and of thoſe the ſtrongeſt, and alſo violent *Vomitories*, produce *Spaſms.*

Practical Corollaries.

I. The matter which is thrown out by *Vomitories* is *manifold.* 1. Plenty of *Spittle.* 2. The *mucus* of the Noſtrils; whence appears the wonderful effect of Emetics in thoſe who are infeſted by a moſt foul *mucus* from the Venereal diſeaſe. 3. The Liquor of the *Fauces* and Gullet; hence Vomitories are the beſt Medicines to deterge the *ſuppurations* of thoſe parts. 4. The *Gaſtric* Liquor. 5. The *Liquor* of the Spleen; and therefore if the Spleen be filled with any *viſcid* matter, *Emetics* are of great ſervice at the beginning of the *diſorder*, whilſt the matter is moveable. 6. The *oily Liquor* of the *Omentum* or Cawl, which, according to Malpighius (*c*), is collected for this uſe, and preſerved in the *Omentum*, that it may temperate the Bile and other humours, which acquire *Acrimony* from too great a motion of the Body: but this *Liquid*, if it abounds too much, and renders the Bile too tenacious, is eaſily drawn out by a *Vomitory.* 7. The *Liquor* of the Meſentery. 8. The Hepatic *Liquor*, for there is no Medicine which *acts* more certainly on the Liver, than an *Emetic.* 9. The Pancreatic *Liquor.* 10. The *matter* of the Inteſtines heaped together from the ſaid *Liquids.*

II. There is no remedy, except the *Paracentheſis* or *Tapping*, more ready in a curable *Aſcites*; for nothing more readily evacuates what is *extravaſated* in the *Abdomen.* Hence alſo the Ancients, as well as the Moderns, were always obliged to apply ſuch a violent remedy; for the beſt Medicines for this *diſeaſe* are ſuch as occaſion *Spaſms.*

III. These

(*c*) *Tract. de Omento, &c. page* 44 to 46. *edit. Lond.*

III. There is not a better Medicine to break *Impoſthumes* of the Lungs, *Pleura*, Mediaſtinum, Diaphragm, Liver, and all the Abdominal Bowels, if they are *ripe*.

IV. Vomitories are of great ſervice in removing *obſtructions* of the whole Body, eſpecially if they are in the lower Belly, to diſſolve what is *impacted* and *ſtagnating*, and alſo to increaſe the *expelling force*.

V. These Medicines therefore are of ſervice in innumerable diſeaſes, both *acute* and *chronical*.

VI. *VOMITORIES* are the moſt dangerous to all plethoric Perſons, for oftentimes they produce an Apoplexy or *Hæmoptoë* in ſuch; alſo to all conſumptive Perſons, and to all that labour under a *hæmoptoïcal Diatheſis*, alſo to all ſuch as are troubled with the Stone and Gravel, or concretions of the Bile, for *bloody Urine* may be occaſioned by too much *friction* and *attrition* either of the Kidnies, or the Bladder, or the Liver againſt a *Stone*; whence all the neighbouring Veſſels are injured; alſo to all who have a Schirrus, Cancer, or contraindicating Inflammation, alſo to thoſe who are liable to Apoplexies, from *too great a quantity* of Blood; laſtly, to all thoſe who have *corrupted Viſcera*.

VII. In *plethoric* and *acute* diſeaſes, *Bleeding* ought to be premiſed, as often as a *Vomitory* is to be given.

VIII. Those who have any leſs *moveable* matter ſtopping in any part, or hidden in the inmoſt receſſes of the Bowels, before they *vomit*, ſhould take ſuch Medicines as are *inciding*, *lubricating*, *relaxing*, and *irritating*: and this being well obſerved, an incredible number of diſeaſes may be cured.

IX. When the *contents* of the Stomach are expreſſed by the firſt or ſecond *act* of *vomiting*, there is always need of ſuch Medicines as are *diluting*, *lubricating*, and *relaxing*. For otherwiſe great pain and anxiety are excited.

X. A *SUPER-PURGATION* is always to be carefully avoided in *vomiting*; for it does not ariſe from any Medicines more eaſily than from *Vomitories*; but if at any time it follows upon them, it may be ſtopped, 1. By *antiſpaſmodic* remedies; namely ſuch as are diluting, relaxing, and anodyne, that is ſuch as give a ſtop to an *impetus*; as drinking of *warm Water*, taking *juice* of *Liquorice*, *Opium*, or by binding the Arms and Legs. 2. By various *Aromatics*: ſuch as all Alexipharmic Confections; namely, *Diaſcordium*, *Treacle*, all the *Philoniums*, *Mithridate*, *&c.* for theſe determine the *motion* of the humours from the *centre* to the *circumference*; for by means of a *Vomitory* the Veſſels of the *circumference* are conſtringed, whence the Liquids are compelled to be moved towards the *centre*. 3. If the *Super-purgation* ariſes from the Veſſels being *relaxed*, and the Stomach being *flaccid*, the *auſtere* Medicines and *Acids* are required; ſuch as *marmalade* of *Quinces* in a pretty large doſe, as ℔ſ. or the *root* of *Tormentil* or *Biſtort*, the *Peruvian Bark*, *Oranges*, *&c.* 4. *Fermented Spirits* alſo are of great ſervice, provided they are given in a pretty *large doſe*, as to ℥v. but if the Patient has been accuſtomed to theſe, then the *doſe* is ſtill to be increaſed.

CHAP. X.

Of DIURETICS.

1. THE *Excretion* of Urine is always made through the *Urethra*, into which it flows from the Bladder; but it diſtills into the Bladder

from the Ureters, for it has no other paſſage into it, as is manifeſt from the following conſiderations: 1. Becauſe thoſe who labour under a *Dyſury*, or difficulty of Urine, occaſioned by a *Stone* in the *Ureters*, are obſerved to have no Urine at all in their Bladder. 2. Becauſe if the Abdomen of a *living Animal* be opened, each Ureter *tied*, the Bladder emptied, and Abdomen ſewed up again, the Animal will moſt certainly die of a ſuppreſſion of Urine, not ſo much as one *drop* coming to the Bladder. Moreover whatſoever enters into the Bladder by the Ureters, flows from the Pelvis, which is nothing but an *expanſion* of the Ureters; and it comes into the Pelvis from the *branches* of the *Papillæ*, which ariſe from innumerable renal Canals, as MALPIGHIUS and RUYSCH have demonſtrated: but all thoſe Canals are *outlets* of the ſmall renal Glands; but if any thing *urinous* ſtops in theſe, it is all derived from the *branches* of the emulgent Arteries.

2. FROM what has been ſaid it appears therefore, that none but *Diuretics increaſe* the power of *ſecreting* the Liquid in theſe Glands, the *paſſage* without the Body remaining open: this may be obtained *five* different ways, and conſequently there are *five* ſorts of *Diuretics*; 1. Thoſe are *Diuretics*, which *relax* the *arterial* Veſſels of the Kidneys, and their lateral ones, though the conſtitution of the Blood remain entire and untouched. 2. All thoſe are *Diuretics*, which diſſolve or dilute *more than uſual*; now the Blood may be ſaid to be diſſolved, when it's *ſpherical* parts are reduced into *ſmaller* ones: and the Blood being thus conſtituted, this *ſecretion* is eaſily augmented by the *relaxation* of the renal Veſſels, nay theſe Veſſels are always *more lax* than others, that is, they make leſs *reſiſtance* to the Liquid flowing in, than any other Veſſels in our

Body; as gaping into the open Pelvis. 3. Theſe alſo are Diuretics; (α) whatſoever apply the Blood remaining the *ſame*, with a *greater* velocity, to the Veſſels alſo remaining the *ſame*. (β) Whatſoever apply the Blood being *diluted* and *diſſolved* with a *greater* velocity, to the *relaxed* and *dilated* Veſſels. 4. Thoſe are *Diuretics*, which determine the *flowing* of the Blood to the Kidneys, more than to the other parts of the Body, without changing any thing in the Veſſels, the Liquids or the velocity of motion. 5. In the laſt place, thoſe are *Diuretics*, which *ſtimulate* the Veſſels into ſecretory contractions.

3. ALL *Diuretics* may be reduced to theſe *five* Claſſes; but before I treat of them *ſeparately*, I muſt conſider the Urine it's ſelf: which conſiſts, 1. Of what we *drink*; and this ſort of Urine is *aqueous*. 2. Of ſome parts of the *Chyle*; and this ſort is crude. 3. Of the *Water* of the Blood; and this is *concocted*; 4. Of parts of the *Solids* of our Body, abraded and rubbed by the *vital power*, and alſo of the *Fluids*, ſo far diſſolved by continual circulation, as to become *acrid*; and this is uſually *red*, *ſmall* in quantity, *oily*, *acrid*, and *terreſtrial*. 5. Of *morbid* parts; and this ſort of Urine is excreted *thick* and *various*. According to this *difference* therefore of Urine, *Diuretics* ought to be *varied*.

4. NOW follow the Claſſes of *Diuretics*, which are five.

I. THE firſt contains all the *Decoctions*, *Emulſions* and *Oils*, taken either from Vegetables or Animals, which were recited above, under the title of *relaxing* and *emollient* Medicines; as *Decoctions* of *Pellitory*, *Mallow*, *Mercury*, Oil of Olives, *Wallnuts*, *Turpentine*, &c. But they are to be adminiſtred with a *regimen*, that they may be determined to the Kidneys; and therefore, 1. They ought to be taken on an *empty* Stomach, in a *cool* Air, uſing *eaſy* motion afterwards. 2. They are to be injected in form of a *Clyſter*, to *foment* and *mollify* thoſe parts: and theſe being thus adminiſtred are ſometimes of wonderful ſervice, when other remedies have been tried in vain. 3. They may be applied alſo to the Kidneys in form of a *Bath* or *Fomentation*; for experience teaches, that thoſe who are put into *Baths* up to the Breaſt, make plenty of *Urine*. But the uſe of the *Diuretics* of this Claſs is ſo great, that the *firſt* place may be given them; for if there is any *obſtruction*, they do not increaſe it like *Stimulaters*, but remove it by *relaxing* the Veſſels. To this Claſs alſo belong thoſe which correct or expel the *Acrid*, which excites *Spaſms*, of what ſort ſoever the *Acrid* is; thus *terreſtrial* Bodies, as alſo fixed and volatile *Alkalines* are of the greateſt ſervice to Infants that labour under a *ſuppreſſion* of Urine from *Milk* turning *ſower*, and alſo to hyſterical Perſons.

II. The ſecond Claſs comprehends all thoſe which *diſſolve* and *dilute* the Blood: but we know only *one Diluter*, namely *Water*; for the reſt that *dilute*, do it ſo far as they have *Water* mixed with them. But *Diſſolvents* are of *two* ſorts; namely, either thoſe which being taken into the ſanguineous Liquid, *diſſolve* and *divide* it's *moleculæ*, by *interpoſing* themſelves; or thoſe which by exciting a *greater* motion, increaſe the *attrition* of the Veſſels, and ſo promote the *comminution* of the Blood; and therefore they are either cutting and penetrating *Salts*, or *Stimulaters*. To this Claſs belong, 1. *Aqueous* Bodies; ſuch as all *mineral Waters*, *whey*, *butter-milk*, *tea*, *coffee*, *ſmall-beer*, *&c.* all which are referred hither, ſo far as they contain *Water*: 2. All the *Salts*; that are known to us, without any exception; as (α) all fixed and volatile *alkaline Salts*; (β) all *ammoniacal Salts*, which are compoſed of a volatile acid Spirit, and a volatile alkaline Salt; (γ) *fixed compound Salts*, prepared of any fixed Alkaline with any Acid, except a Vegetable ferment; which are the better, as they are more ſubtile and acrid: (δ) *Saponaceous* Bodies, made of Alkalies with any Oil: hither belong all *oily volatile Salts*; ſuch as the *Offa* HELMONTIANA, which is uſually given from gr. jv. to ℈j; and it is compoſed of any volatile alkaline Spirit that is not oily, as of the pureſt alkaline Spirit of Sal Ammoniac, pouring upon it an equal quantity of the pureſt Alcohol of Wine, which being done there is a *coagulum* formed in that part where the ſurfaces of theſe Liquors touch each other; then if you ſhake them, both Spirits are preſently *coagulated* into a lump, and then by diſtilling them often with a retort, they are intimately united (*a*): and thus ſuch an *oily Salt* is ſoon obtained; to the preparing of which ſome months are required, after STARKEY's method, namely by pouring ætherial Oil of Turpentine on any alkaline fixed *Salt*, that is very ſtrong and pure, and fuſed and melted by a vehement Fire, *&c.* which makes what is called STARKEY's *Soap* (*b*). Hither alſo belong thoſe which are called *fixed Soaps*: ſuch as may be made of Salt of Tartar boiled a long time with Oil of Olives or of Turpentine; (ε) the *ſaline parts* of Animals; as their *ſaline juices*, for inſtance, the freſh *juice* of Sea *Oyſters*, the juice of Sea *Muſcles*, and *Crabs* recently

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(*a*) Conſult HELMONT. *Tract. de Lithiaſi, cap.* 3. *ſect.* 5. alſo BOERHAAVE *Operat. Chem. page* 251, 252. alſo his *Materia Medica, ſect.* 66. *n.* 5.

(*b*) See STARKEY *Pyrotechn.* and BOERHAAVE *Operat. Chem. page* 160 and 163.

recently expreſſed, and the *juice* of *Millepedes*, which taſtes like *Borrage*; (ζ) *vegetable juices* of thoſe Plants, as afford by Chemiſtry but little Oil, and much eſſential Salt; as *Opium*, which on that account is reckoned amongſt the *Diuretics*; as alſo the *juice* of *Parſley*, *Sorrel*, *Fumitory*, *Chervil*, *Eryngo*, *&c.* of which ſome of the *Salts* approach nearer to Nitre, and others to Tartar.

III. The third Claſs contains *four* different kinds of Medicines: ſuch as, 1. All *Acrids*, which *ſtimulate* the Veſſels, eſpecially thoſe of the Kidneys; amongſt theſe the principal are ſome *Inſects*, as *Bees*, *Graſs-hoppers*, *Ants*, *Cantharides*, *Millepedes*; which alſo *diſſolve* the Blood, and accelerate it's *motion*, and excites a ſort of *artificial fever*. 2. All *Salts*, which *diſſolve* the Blood, and at the ſame time increaſe it's *velocity*: hither alſo chiefly belong one or two kinds of Salt; ſuch as we know to be driven from *Amber* and Vegetables; but *Salt* of *Amber* is a ſpecies of rectified acid volatile Salt, and exceeds all others, if it be given to ℈j. with a regimen. 3. All *fixed* and *volatile alkaline Salts*, without diſtinction. 4. Moderate *heat* and *motion* of the Body, without *ſweat*.

IV. The fourth Claſs includes ſome *Diuretics*, which are in a manner *ſpecific*: ſuch as any *balſamic Aromatics*, that is, ſuch as conſiſt of a ſubtile Salt and an involving Oil; as *Saffron*, *Rhubarb*, *Sparagus*, *freſh Caſſia Fiſtula*, *Nutmeg*, *Juniper*, *Turpentine*, and all *native Balſams*, *&c.* for theſe being taken increaſe the *quantity* of Urine, and even *change* all their qualities, as colour, ſmell and taſte; thus *Saffron* and *Rhubarb* gives it a *flame* colour, Caſſia taken in a ſmall doſe turns it *green*, in a *greater* quantity, *brown*, and in a ſtill *greater*, *black*; thus alſo *Sparagus* gives a *ſtink* to the Urine, but *Turpentine* gives it a ſmell of *Violets*.

Violets (*c*). But ſuch changes never happen to our other Liquids; whence it comes to paſs, that we uſe to call theſe *Diuretics ſpecific.*

V. The fifth Claſs contains thoſe, the *effects* of which diſcover themſelves principally and more ſenſibly about the Kidneys and Bladder; as *Cantharides*, on the taking which there ariſes a *heat* in the Loins, and a *dropping* of Urine, or *Strangury.* Hither alſo are to be referred the *Inſects* mentioned already; as alſo *Beer* in thoſe who are *not accuſtomed* to it; thus alſo *flat Milk* excites a Strangury. Laſtly, all *acrid* and *diſſolving Diuretics* belong to this place.

Practical COROLLARIES.

I. *DIURETICS* ought to be preſcribed, in order to provoke Urine, in the ſame *order* as they are here deſcribed; that is, always beginning with the *firſt* Claſs, and then proceeding to the reſt *ſucceſſively.*

II. In *acute* diſeaſes, there is room only for *three* of theſe Claſſes; the *Relaxers*, *Diluters*, and *Temperaters of Acrids.*

III. In *chronical* diſeaſes, if the *morbid* matter is to be expelled by the Kidneys, firſt the Veſſels are to be *relaxed*, then the Blood is to be *diſſolved* and *diluted*, and then *Acceleraters* are to be given, and in the laſt place *Stimulaters.*

IV. The Blood is more *purged* this *way*, than by every *evacuation* by Stool; for *Diuretics* act on the Blood it's ſelf, but not all Purges: therefore a Phyſician who duly attends to all ſymptoms, may

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(*c*) Thus alſo *Balſam of Capivi* manifeſtly gives a *bitter taſte* to the Urine, according to Fuller, *Pharmacop. Extempor. de Miſt. Balſam. page m.* 247.

may often procure a *ſalutary criſis* in *violent* diſeaſes by thoſe Medicines, without any notable *perturbation* of the Body. Beſides the Kidneys are the beſt *depuratory* of the Blood; becauſe all the *thicker* parts of the Blood may paſs through them.

V. THERE are *diverſe* ſpecies of *intercepted* Urine; and indeed ſo many as there are Claſſes of *Diuretics* enumerated; whence it follows, that there ought to be *different methods* of healing. But now there are various cauſes of *intercepted* Urine; namely, 1. A *Conſtriction* of the urinary paſſages; 2. An *Infarction* of them by a *calculus*, or ſome other ſubſtance. 3. *Too great* a *dryneſs* of them, and *defect* of Liquid; which ariſes either from *Acrimony*, as in *acute* diſtempers; or from too great a *thickneſs* and *lentor* of the Fluids, as happens in *ſedentary* Perſons; or laſtly from the Liquids being too much *derived* into the other parts. 4. A *Palſy* of the renal parts; and this ſcarce admits of a cure.

CHAP. XI.

Of SUDORIFICS.

1. EVERY *Medicine, by the power of which a ſenſible moiſture exhales through the Skin, is called a Sudorific:* in *Greek* Ιδρωτικὸν; and conſequently whatſoever *ſenſibly* expels the Liquids through that part of the Skin, which is endowed with pipes appropriated to ſweat. Now theſe pipes are demonſtrated to be the *outlets* of the ſubcutaneous Glands, or the *ſmalleſt* Veſſels ariſing

from

from the Lymphatic Arteries, or the laſt *ends* of them.

2. HENCE therefore it appears, that the ſubſtance of *ſweat* is derived from the Arterial Blood, and that it is not an *excrementitious humour*, as is generally thought, but a *juice* entirely neceſſary to preſerve the *flexibility* of our Machine: for that the Body may remain *flexible*, there ought to be many interſtices between the parts which compoſe it, and theſe interſtices are called *pores*; and leſt thoſe *pores* ſhould be loſt by the *concretion* of the ſolid parts, it has pleaſed GOD to conſtitute that Liquid, called the SANCTORIAN, to flow perpetually through theſe *pores*; which Liquid is the very ſubſtance of the *ſweat*, and the moſt moveable, moſt ſubtile, and moſt friendly part to the Nerves, ſo long as it continues in it's *natural ſtate*; and thus it ought not to be *drawn out* of the Body, any more than the Blood it's ſelf, unleſs it is corrupted by the nature of ſome *diſeaſe*: and indeed *ſweat* never ariſes in a *healthy ſtate* of the Body, but as often as any cauſe is applied to the Body, which may take away the *balance* between the Veſſels and the contained Fluids, ſo that the *force* of the Liquids may *exceed* the *reſiſtance* of the Veſſels, and at the ſame time ſome Function may be too much *increaſed*, then the *ſweat* manifeſts it's ſelf. *Sweat* therefore always ſhews that the Body is *out of order*, and this *diſorder* will continue, till the cauſe which excites the *ſweat* is removed, and till it's effects are corrected.

3. THE ſubſtance therefore of *ſweat*, which in it's *natural ſtate* goes out under the name of inſenſible perſpiration is very *mild*, and greatly different from Urine: but *ſenſible ſweat*, if it be much urged, approaches nearly to the nature of Urine; is ſometimes *thick*, *oily*, and *fœtid*, nay and ſometimes

times becomes almoſt *bloody*, as we may ſee in ſome Porters, whoſe *ſweat* under the *Arm-pits* will ſometimes ſtain their ſhirts, as it were with *Blood.*

4. *SWEAT*, as well as *Urine*, is promoted *five* ways; 1. By *relaxing* the emiſſaries or outlets, all the Liquids remaining the *ſame.* 2. By *diluting* and *diſſolving* the Blood: now the Blood is ſaid to be *diluted*, when it's more *ſubtile* and *fine* part exceeds the *red* part; and it is ſaid to be *diſſolved*, when the *red Moleculæ* are reſolved into thoſe leſſer *ſix*, of which they conſiſt, as was obſerved before. 3. By applying (α) the Blood continuing the *ſame* to the outlets continuing alſo the *ſame*, with a greater *velocity:* (β) the Blood being *diſſolved* and *diluted*, to the *relaxed* emiſſaries, with an accelerated *velocity*; in which caſe a great *ſweat* ariſes. 4. By determining the Blood to the *extremities* of the Body: whence whatſoever changes the *courſe* of the Blood from the *inward* parts towards the *outward*, will excite a *ſweat* by deriving it; as the paſſions of the mind. 5. By exciting *Spaſms* in the laſt *Villi* of the ſubcutaneous Glands.

5. *SUDORIFICS* may be varied, according to the different *nature* of the matter to be evacuated: for *ſweat* is *manifold*; and ariſes; 1. From the aqueous *part* of our drinks. 2. From *crude* Chyle: hence alſo *ſweat* is wont to break forth from all thoſe who have *weak* Bowels, at the time when the Chyle ought to be mixed with the Blood; as is obſerved in phthiſical Perſons, and ſometimes in Women that give ſuck. 3. From *concocted* Blood; but chiefly in *fat* Men, whoſe inſenſible perſpiration is daily diminiſhed, becauſe of the *fat* ſtopping up the Veſſels; but they alſo daily ſweat more. 4. From the Blood being too much *diſſolved*, and from too great a *contrition* of the Veſſels, a *reddiſh*, *fat*, *acrid*, *terreſtrial*, and *ſaline ſweat* ariſes, ſo that it ſticks to the Skin, as if

infixed into it. Tachenius took the *Lixivium*, in which foul *linnen* had been macerated and waſhed; and then *diſtilled* this *Lixivium*, conſiſting only of *alkaline Salt*, and obtained a *Salt* from it, like the *Salt* of diſtilled Urine, but not ſo fetid (*a*). Thus alſo a great quantity of volatile Salt is found in the *ſweat* rubbed off from Horſes (*b*). But this *ſweat* for the moſt part breaks forth, when the Blood is very *violently* moved through it's Veſſels; and therefore it may be obſerved in thoſe who are much fatigued. 5. *Sweat* is ſometimes *morbid*, and hence it is moſt *various*: for ſometimes it is quite *watery*, as in Women with Child, and conſumptive Perſons, in whoſe *ſweat* there is ſcarce any colour, ſmell, or taſte to be obſerved; ſo that it ſeems to be the *moſt diluted* part of the Blood: but ſometimes it is very *viſcous*, very *yellow*, *red*, and ſometimes it *ſtinks* very much; ſuch as is the *ſweat* of thoſe who have the Plague, which frees the *Patients* from that *diſeaſe*.

6. Now follow the Claſſes of *Sudorifics*, of which there are *four*.

I. The firſt contains all thoſe which *relax* the Veſſels: and they are either *internal* or *external*. The *internal relaxing Sudorifics* are all thoſe, which are related amongſt the *Diuretics*, except thoſe which *ſpecifically* affect the Kidneys; thus *warm Water* ſweetened with Honey excites a copious ſweat: thus alſo in burning Fevers *Barley Water*, or ſuch like, is an excellent *Sudorific*, becauſe it relaxes the *conſtringed* Veſſels. Hither alſo belong thoſe which remove a *Spaſm* of the Veſſels, or *Demulcents*, and temperaters of *Acrimony*; as *Opium*, *Crab's*

(*a*) See Tachen. *Hippocr. Chym. Cap* 12. *page m.* 54.

(*b*) *Idem ibid. page* 55.

Crab's Eyes, and *terreſtrial Abſorbents.* But the external *Laxatives* are, 1. All Frictions. 2. All *warm Vapours*, and eſpecially the *aqueous.* Hither alſo belong *Baths*; but they preſs the Body too much, whence often ariſes a fainting. Hither alſo ought to be referred *Inunctions* by mild Oils, Fats, Marrows, *&c.* which render the Skin *lax* and *ſoft*; though of themſelves they rather *ſtop* a *ſweat*, as appears from the ancient *Wreſtlers*, who before the contention anointed their Bodies with *Oil*, to make their Joints *limber*; for by this means the *ſweat* was hindered. Hither belongs in the laſt place the *waſhing* of the Body with ſaponaceous Water.

But the *uſe* of theſe *Sudorifics* agrees, 1. In every *diſeaſe* that ariſes from a very great *cold*; which is the greateſt injury to the external Skin and to the Lungs, rendering their Veſſels rigid, and coagulating the Fluids. 2. In any *diſeaſe* where *ſordes*, *ulcerous* or any *morbid cruſts*, *ſcabs*, *ulcers*, *elephantiaſis* or *leproſy* adhere to the Skin. 3. Where there is a *Spaſm* of the Emiſſaries; which may be known by the *dryneſs* and *hardneſs* of the Skin. 4. Whenſoever a *diſeaſe* happens by any *Acrid* impacted *externally*; and therefore ſeeing the Plague is of the nature of a Poiſon *externally* applied, theſe *Sudorifics* are of the greateſt ſervice in expelling it. 5. In the *moſt acute* diſeaſes, where the Blood tends vehemently toward the *internal Viſcera*, as in the Small Pox; for in theſe caſes, Phyſicians make uſe of this Claſs of *Sudorifics* with ſucceſs; though Sydenham juſtly condemns the provoking of *ſweat* by *Cordials* and *ſtrong internal Sudorifics* in the Small Pox, and it may be queſtioned, whether the provoking of *ſweat*, attempted by theſe *Sudorifics*, would not be of great ſervice in curing any inflammatory diſeaſes.

II. The ſecond Claſs contains the *diſſolvers* and *diluters* of the Blood, which are enumerated in the *ſecond* Claſs of *Diuretics*: but the greateſt *diluter* is Water, the power of which is increaſed by *heat*; hence *warm Water* is the greateſt *Sudorific*. Now ſome *diſſolvents* immediately *diſſolve* the Liquids; and of theſe there is but *one* that can ſafely be given in acute caſes, namely, Nitre and the preparations of it: but others diſpoſe the Veſſels to *act* on the Liquid, and *diſſolve* it; thus Vinegar ſweetened with *Honey*, and diluted in *Water* is an excellent *Sudorific* in acute diſeaſes: for example,

℞ *Aceti.*
Mellis ana ℥j.
Macis q. ſ.

Diluantur in Aquæ ℥xij *vel* xiv. *Sumat* æger *inſtar* Theæ *aut* Caffe, *& in Lecto expectet* ſudorem.

TAKE Vinegar *and* Honey, *of each one ounce, of* Mace *a ſufficient quantity*; *dilute them in twelve or fourteen ounces of* Water, *Let the Patient drink it after the manner of* Tea *or* Coffee, *and lie in bed to* ſweat.

This is a Medicine of HIPPOCRATES; but plain Vinegar does not *coagulate* the Blood, nor any fermented Acids diluted.

III. The third Claſs agrees with the *third* Claſs of *Diuretics*, excepting only thoſe which determine the Liquids to the Kidneys: therefore whatſoever is taken *hot*, as alſo *warm Aromatics*, *Opiates*, and *vehement motion* are great *Sudorifics*.

IV. The fourth Claſs contains thoſe which determine the Liquors to the *external habit* of the Body; ſuch as, 1. All that relax the *external* parts. 2. Thoſe which dilute, diſſolve, and move toward the *external* parts. 3. Thoſe which diminiſh the *external preſſure* of the Air. 4. Thoſe which increaſe the *force* of the Heart, or it's *pulſations*, as to number and ſtrength : hence therefore all *Cordials* are *Sudorifics* ; as Rheniſh Wine, freſh juice of Citron, penetrating Spices, volatile Salts, *&c.* 5. Thoſe which ſtimulate *externally* : as any *Acrids* applied to the Skin ; ſuch as Vinegar, and Ginger, which is moſt ſubtile and penetrating, and is highly commended by HELMONT (*c*). 6. To theſe alſo may be added thoſe which reſtore the *obſtructed motion* in the *internal* parts ; thus, for example, paſſions of the mind reſtore *obſtructed* reſpiration.

As for what is pretended about *ſpecific Sudorifics*, it is all trifling ; for all theſe at laſt become *Sudorifics* when the Body is diſpoſed to ſweat, otherwiſe they do nothing ; for tho' *Venice Treacle* be taken to the quantity of ℥j, unleſs the Body is diſpoſed to *ſweat*, it will only *dry*, and not provoke a *ſweat* ; nor indeed does any other Medicine provoke *ſweat ſpecifically* ; but thoſe which are thought to have that effect, perform it only, 1. As they ſupply matter for *ſweat* : 2. As they remove the obſtruction of the *ſweat* : 3. As they determine the Blood to the *circumference* of the Body. But among theſe *Specifics*, there are ſome related by AUTHORS ; ſuch as, *ſealed earth*, *leaves* of *Scordium*, *Swallow-wort*, *&c.* alſo Bezoar, Pedro del porco (*d*). *Goa-ſtone*, which is compoſed of Bezoar, Am-

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(*c*) In his *Tract* intituled TARTARUS NON IN POTU, *ſect.* 9.

(*d*) See the beſt *hiſtory* of all theſe *Stones* in KÆMPFER, *Amœnitat. Exotic. Faſcic. II ſect.* 3. *page* 391, to 406. As for the *lapis hyſtricinus Malacenſis*, or *Pedro del porco*, of which we have ſaid ſomething already, in *page* 133, the uſe of it is ſhewn and highly extolled by TULPIUS, *Libr.* iv. *Obſerv. Cap.* 52, *page m.* 363, and by HELVETIUS in his *Traité des Maladies, &c. Tom. II. page m.* 70.

ber, and Gum Tragacanth (*e*); alſo *lozenges* or *troches of Vipers*, *&c.* and the Author teſtifies, that he has given the *genuine* Bezoar-ſtone, to the quantity of ʒj, to a Child of two years old, ſufficiently diſpoſed to *ſweat*, but without any effect; and he teſtifies alſo that no *ſweat* was procured by the troches of Vipers given to ʒiij.

COROLLARIES.

I. From what has been hitherto ſaid of *Sudorifics* we gather, 1. That there are various and quite oppoſite *cauſes* of *ſweat*; as the *greateſt* ſadneſs and joy, fear and hope, *warm* Water and *cold*. 2. That there is alſo various and quite oppoſite *effects* of *ſweat*: for *ſweat* ſometimes *diſſolves* the Blood, and ſometimes *thickens* it, according to the condition of the ſubject from which it is drawn; therefore nothing can be ſaid univerſally of the *effect* of *ſweat*. 3. That various *applications* may be uſed to draw out *ſweat*; ſometimes it is procured by the *waſhing* of the whole Body, ſometimes by *heating* it, by *friction*, and *violent motion*, ſometimes by the adminiſtration of various *internals*. 4. That there are various *neceſſities* of drawing out the *ſweat*; thus for example in an *Anaſarca*, we muſt

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(*e*) This *Stone* is called by the *Portugueſe*, *pedra cordial*, and is made at *Goa* in the *Indies* by the Jesuits, of *cordial* and *alexipharmic Species*, in which the *Bezoar Stone* is an ingredient: it was firſt made by F. Caspar Antonio, whence alſo it took it's name; and afterwards by F. Nicol. Manuche, which is diſtinguiſhed from the former by the letters N M ſtamped on the ſurface, with the figure of a Goat or ſome other Animal, on the oppoſite ſide; it's *figure* is oval and round; it's *colour* is grey *within*, blackiſh and ſhining *without*; and diſtinguiſhed with golden ſpots, and ſometimes all over gilded. It's uſe is *frequent* and highly eſteemed in the *Eaſt Indies*, it is ſold by the *pound* and therefore varies in it's price according to it's bigneſs. See Kæmpfer *ibid page* 397.

muſt *ſtimulate*, and expel what is *ſlow* and *ſtopping*: therefore every morning and evening the following preſcription may be given.

℞ *Theriac.* ʒij.
Spir. Juniperi ℥jß.
Oxymel. Scillit. ℥ij.

Diluantur in Cereris Cereviſiæ meracæ, *vel* Hydromel. ℥ix. *vel* x. *Sumat* æger, *& diſponat Corpus ad* ſudorem.

TAKE of Venice Treacle *two drams*, *of* Spirit of Juniper *an ounce and half*, Oxymel of Squills *two ounces*, *dilute them in nine or ten ounces of* genuine *Mum or Mead. Let the* Patient *take it*, *and diſpoſe his Body to* ſweat.

THE ſame is done with ſucceſs in other *chronical* diſeaſes, as in the Green-ſickneſs: thus alſo in the Leproſy, becauſe all nouriſhment is ſtopped, therefore the procuring of *ſweat* is required; but not by *Aromatics*, which heat the Body *internally*, but in ſuch a manner, as to make all hot *externally*, and to waſh all away *internally*: therefore let a Pill of *Venice Soap* be given every hour, ſo that ʒij may be taken in a day; and then, after the *uſe* of theſe for *three days*, the Patient may drink any *antiſcorbutic decoction*, as of *Guiacum*; then let him go into a *warm Bath* to provoke a *ſweat*. Moreover if any thing is to be *reſolved* about the *firſt* Veſſels, as in the *diſeaſes* of the Breaſt, and other *acute* diſeaſes, and if the cauſe of the *diſorder* ariſes from an *Alkali*, let him *drink plentifully* of Honey, Vinegar, or Rheniſh Wine, with Water; and at the ſame time let his Skin be relaxed *externally*: but in the middle of the *ſweat* a *decoction* may be given with *Nitre*. But if the *cauſe* of the *diſorder* be from an *Acid*, then let *Alkalines* be given; and ſo let always thoſe things be given, which are *oppoſite* to the *cauſe* of the diſeaſe. 5. That there are various *opportunities* of procuring a *ſweat*; for at ſome times it ſucceeds much more readily and happily, than at others: the *knowledge* of which depends entirely on the obſervations of the Phyſicians; thus in the Small Pox, from the *firſt day* to the *eighth*, *ſweating* is promoted and this ſeems to be a proper time enough for *ſweating*; and the Patient may be cured by *continual ſweating*, but withthis *regimen*, that theHumours may always becopiouſly *diluted* and the Veſſels *relaxed*; for *hot* and *drying* things muſt by no means be then given, as being very pernicious. But in *acute diſeaſes*, many Phyſicians agree with the vulgar, in giving *Sudorifics*, becauſe they obſerve that Nature often relieves herſelf on the *fourteenth day*, by *ſweating*; and thence fall into this wretched *practiſe* of giving *hot* and drying things, by which method they deſtroy many: but if they were to lay aſide all *hot Sudorifics*, and give only thoſe, which *dilute* the Blood, and *relax* the Veſſels, then the Patients would *ſweat* kindly, and have a laudable *criſis* on the *ſeventh*, or *fourteenth* day: for thus in the *ſweating ſickneſs* of the *Engliſh*, many were cured by a continuation of the *ſweating* for twenty four hours, by *internal Diluents*, and *external relaxing* Medicines: whereas on the contrary, all thoſe, to whom *internal Diluents* were not adminiſtred, died *(f)*.

II. FROM what has been ſaid, it appears alſo, 1. That *Sudorifics* are to be varied, according to the various *cauſes* of the diſeaſe: thus in diſeaſes ariſing from an *Alkali*; as for inſtance, a young Man

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(f) See Dr FRIEND's *Hiſtory of Phyſic, Part II. page* 332.

Man is ſiezed in ſummer time by a *moſt ardent Fever*, to get the better of which a *very quick* remedy is required, that is a *Sudorific*; but before this is given him, the *cauſe* of the diſeaſe ought to be inquired into: for let us ſuppoſe, that it is too much *dryneſs* and *inflammation*, it is manifeſt that *Diluters* and *Stimulaters* are required, becauſe of the *defect* and *obſtruction* of the *powers*, which indicate a *Stimulus*. Thus, that Diluters may operate the better, let a *liquid* Medicine be given, the baſe of which may be ſome *diſſolving Acid*, and for a *Stimulus* let Rheniſh Wine be added, which may be diluted with a large quantity of *Water*, and may have an *antiphlogiſtic power* added to it by the help of Nitre; for example,

℞ *Vin. Rhenan.* ℥viij.
Nitri ʒij.
Succ. Limon. recent. expreſſ. ℥j.
Syr. Viol. q. ſ. vel ad ℥ij.
Diluantur hæc cum Aquæ communis ℔ jv.
Singulis horis capiat ℥ij. *calidè cum determinatione ad* Sudorem; *ſi vero* Alviter *tantum* ſudet, *plus* Vini *addatur*, *ſi* minus, *plus* Aquæ.

TAKE of Rheniſh Wine *two ounces, of* Nitre *two drams, of* Lemon juice *freſh ſqueezed, one ounce; of* ſyrup of Violets *a ſufficient quantity, or to two ounces.*

LET theſe be diluted with two quarts of common Water.

LET the Patient take every hour two ounces warm, with a determination to ſweat; *but if he* ſweats *but* little, *let more* Wine *be added, if* too much *more* Water.

But if the *cauſe* of the diſeaſe is an *Acid*, then inſtead of Rheniſh Wine, let him take ſome other Liquor, as *Sal Volatile Oleoſus*; but if the *cauſe* be ſomething *tenacious*, let *diſſolving* Salts be added. 2. That *Sudorifics* are to be varied alſo, according to the various *nature* of the diſeaſe. But the *nature* of a diſeaſe depends (α) on the *peccant* matter; (β) on the *efficient* or *applying* cauſe, that is, on the *vital power*; thus therefore, if the matter is *tenacious*, let ſtrong *Stimulaters* be given, as *Alkalines*; but if it be of the nature of the venereal diſeaſe, then Mercury determined to *ſweating* is the beſt remedy. 3. That *Sudorifics* ought to be varied, according to the different *ſeats* of the diſeaſe. 4. That different *Sudorifics* are required in different *degrees* of a diſeaſe; thus in the *beginning* of the Small Pox a *Sudorific* that reſiſts Inflammation is required; but on the *fourteenth day*, for the moſt part *ſaponaceous* Medicines are required, and *drying aromatic decoctions*.

THEOREMS.

I. The greateſt *power* of *Sudorifics* conſiſts in *reſolving* the Liquids, and in *opening* the *obſtructions* of the Veſſels. Now the Liquids are *reſolved* either by *diluting* or *dividing*; whereſoever therefore it is neceſſary to *diſſolve*, there *Sudorifics* are required: but the deobſtruent *power* of *Sudorifics* conſiſts in *relaxing* the Veſſels, or in diſſolving their *contents*.

II. In *Sudorifics* conſidered by themſelves, there is a great power of *coagulating* and *obſtructing*: whence it comes to paſs, that what remains, becomes thick, coagulated, and ſometimes as hard as a ſtone, afterwards by no art to be *reſolved*; and hence it is, that no inflammatory diſeaſes ſooner turn to a *gangrene*, than thoſe which ariſe from violent *exerciſe*.

III. Whilst *Sudorifics* incraſſate, they alſo obſtruct at the ſame time; and whilſt they conſume the Liquid, the Veſſels contract themſelves, and are ſtraitned, and their *Fibres* grow ſtiff.

IV. Almost all Medicines may be converted into *Sudorifics*: thus if a *purge* be adminiſtred, and the Perſon preſently diſpoſed to a *ſweat*, there will ariſe a great expulſion of *ſweat*; and the *ſtronger* the *purge* is, the more *copious* will the *ſweating* be: but in chronical diſeaſes, it is an *arcanum* to add *purges* to *Sudorifics*, as the *Trochiſci Alhandal*, &c. It is the ſame with *Emetics* and *Diuretics*, if they are determined towards the Skin.

CHAP. XII.

Of DIAPHORETICS.

1. *DIAPHORETICS are Medicines, which drive the morbid matter out of the Body, under the form of the Sanctorian Perſpiration*; or rather *all thoſe which increaſe the Sanctorian Perſpiration.* Therefore that we may the better underſtand the nature of theſe, we muſt conſider by how many *ways*, and from what *cauſes* Perſpiration is increaſed.

2. The *cauſes* therefore of the *increaſe* of Perſpiration are, 1. The *increaſed force* of the Bowels; which divides our Liquids into *minutiæ*. 2. All thoſe which determine the Liquids ſo *diſſolved*, towards the *external* parts; by *external* parts I mean all thoſe that can be touched by the Air, ſuch as the Skin, Mouth, Lungs. 3. Thoſe which ſo diſ-

poſe the *external Skin*, that it may *readily* tranſmit the Liquids under an *inſenſible* form, but not the more *thick* and *ſenſible*: in order to which the Skin ought neither to be too *lax*, nor too *tight*. 4. Thoſe which perform together the three juſt mentioned: and as there are no Medicines of this kind known to us, we may thence conclude, that there are no *proper Diaphoretics*, that is, which certainly and undoubtedly obtain ſuch an effect.

3. *DIAPHORETICS* therefore may be divided into the *three* following Claſſes, according to the *three* former *cauſes* of an increaſed Perſpiration.

I. THE firſt Claſs of *Diaphoretics* contains thoſe which increaſe the *force* of the Bowels, that is, the *elaſticity* of the Veſſels: now this is increaſed, whereſoever the *Fibres* of the Veſſels become more rigid and hard. To this Claſs therefore belong, 1, Whatſoever aſtringe, or rather contract the Solids, that is, which by inſinuating themſelves between the Interſtices of the *laſt parts*, and ſtopping there, make thoſe parts more flexible or more rigid: ſuch are *Opium*, the *Peruvian Bark*, all *aſtringent Roots*, *auſtere Wine*, *&c.* Moreover as *Diaphoretics* conſtringe, and do not relax, it is manifeſt, that whatſoever increaſes the *ſenſible* Excretions, diminiſhes a *Diaphoreſis*: which plainly agrees with the SANCTORIAN Experiments. 2. *Exerciſes* of the Body, as *walking*, *riding* on *horſeback* or in a *Coach*, *&c.* by the help of which experience teaches us that the SANCTORIAN Excretion is promoted. 3. Very *gentle Stimulaters*, or *ſtrong* ones a little *enervated*; for thus *Colcquintida*, infuſed in a ſmall quantity of Wine, becomes an excellent *Diaphoretic*; thus alſo *Corroſive Sublimate* to *gr.* j. or ij. mixed in ʒij or iij of *Rob* of *Elder*, and ſo given to the quantity of $\frac{1}{20}$ part of a grain for *one doſe*, is of great ſervice in Chronical Diſeaſes; and in like manner any

Acrids may be ſo *mitigated*, as to become *Diaphoretics.*

II. The ſecond Claſs includes all thoſe which determine the *perſpirable* Matter to the Skin: ſuch as, 1. Air moderately *warm.* 2. *Moderate* Exerciſes. 3. An *equal* Circulation of the Liquids; which happens, when all the parts of the Body either *equably* reſt, or are equably *moved.*

III. The third Claſs contains thoſe which give a *due temper* to the Skin, ſo that it be neither too *looſe*, nor too *tight.* And this is performed by *Frictions*, *Lotions* and *Deterſions.*

CHAP XIII.

Of UTERINES.

1. To *Uterines* are referred *Emmenagogues*, *Ariſtolochics*, and *Ecbolics*; or thoſe which expel the *Menſes*, the *Lochia*, and the *contents* of the Womb. Moreover *Emmenagogues* are properly thoſe, which promote the Secretion and Excretion of the *menſtrual Blood.* Now the Secretion is from the whole maſs of Blood into the Uterine Veſſels; but the Excretion is from the Womb through the Veſſels adhering partly about it's *internal Orifice*, partly within it, and partly in the *Vagina.*

2. Now this *derivation* into the Womb, and *Excretion* from it are made, becauſe the Veſſels juſt mentioned being filled with *abundance* of Blood are ſo far diſtended by the *force* of the Heart, that the *orifices* of the little Arteries are at length dilated, whence follows an *eruption* of the Blood; but when

the *force* of the Heart ceaſes, and the *Plethora* is relieved, they contract themſelves again: but that the Uterine Blood is *preſſed* by the *force* of the Heart is manifeſt from hence, that if the *Placenta* is broken off in a Woman with Child, the *Fœtus* ſtill remaining in the Womb, there follow ſo great a *hæmorrhage* that the Mother dies; becauſe the Blood is urged by the *force* of the Heart, and the Uterus is ſo diſtended by the contained *Fœtus*, that the *orifices* of the Veſſels cannot contract themſelves. The ſame alſo may be gathered from the flowing of the *Lochia.*

3. Now if it is enquired why the efflux of the Blood is not *always* from thoſe Arteries, but only at ſtated times? It muſt be conſidered, that the *ends* of the Arteries are in a manner *trifid* or divided into *three* Branches; of which the *middle* one goes into a Vein, and the *two lateral* gape into Cavities, *one* into a Gland, and the other into Lymphatic Veſſels: the *firſt* Branch therefore tranſmits the *thicker* Blood, and the other *two*, becauſe they are more tender and ſmall, tranſmit only the more *ſubtile* part of it. Now let us ſuppoſe, that there is an *obſtacle* in the Veins, for example, from a *Plethora*, or a greater *preſſure* than uſual in the Arteries, then the *lateral* Veſſels muſt be ſo far dilated, that thoſe which before admitted nothing but Lymph; now admit the *red* Blood: becauſe they are of a finer ſtructure, and gape into Cavities, where there is no *obſtacle*, *reſiſting* the *Impetus*; but is quite otherwiſe with regard to the *middle* Branches; and as ſoon as that *obſtacle* in the Veins is removed, or the *preſſure* and *force* of the Heart is diminiſhed, namely, when the plenty of Blood is diminiſhed by flowing, then theſe *lateral* Veſſels contract themſelves, and the Blood goes again into the Veins. This Argument may be illuſtrated by the example of the external

horny coat of the Eyes; which in the natural ſtate is evidently *white*, hardly any but the lateral Veſſels of the Arteries going to it; but if any *obſtacle* is put in the way to the Vein, as if it be compreſſed, or if the end of the Artery be obſtructed, or contracted, ſo that the Blood cannot flow readily out of the Artery into the Vein, for example, if the Neck be *ſtrait* bound, then thoſe Veſſels of the *Cornea* which were at firſt *inconſpicuous*, will grow *red* and *conſpicuous*, by means of this *preſſure*; becauſe the Blood being hindered from flowing into the Veins is preſſed into the *lateral* Veſſels: but as ſoon as that *obſtacle* is removed, this *redneſs* vaniſhes. It is the ſame in the Uterine Veſſels, where there are Lymphatic Veſſels, or the ſmalleſt extremities of Arteries gaping into the Cavity of the Womb. But that this Blood flows out of thoſe *lateral* Veſſels (which in their natural ſtate do not receive the Blood, but a *finer* humour for the lubrication of the parts) being dilated, appears plainly enough from the flowing of the *Lochia*, which gradually loſe their *bloody* colour.

4. Now let us ſee what is the cauſe of the firſt *eruption* of the *Menſes* in Girls: which indeed, to ſay it in one word, is nothing elſe but a *Plethora*; and this ariſes from hence, that in a Virgin, from her Nativity to her ſtate of Puberty, the *quantity* of Blood gathered by the force of the *Viſcera* increaſes, for ſuch an *increaſe* is entirely neceſſary for the greater diſtenſion of the Veſſels, and the increaſe of the Virgin: but after ſhe is arrived to the *limits* ſet to her growth, ſo that the Veſſels can no longer be dilated and diſtended, a *Plethora* muſt neceſſarily ariſe, from the *increaſe* of that Blood which ſtill remains; for there is no reaſon why it ſhould ceaſe, ſeeing the *force* of the *Viſcera*, by which it is gathered, is ſo far from being diminiſhed, that it is

rather increaſed: therefore the *ſuperfluous* Blood muſt be expelled by the *leſs reſiſting* Veſſels, ſuch as the Uterine; otherwiſe the Girl will be *ſick*.

5. But if it be enquired whence it comes to paſs, that theſe *menſtrual fluxes* do not happen in Men as well as in Women? The Reaſon is, that Men later attain to the *bounds* of their increaſe than Women; for as ſoon as they arrive thither, ſome *excretion* is increaſed in them at *ſtated* times: for it is manifeſt from the *Obſervations* of Sanctorius, that Men are ſubject to a *Plethora every Month*; but which goes off either by a larger *ſweat* or *Urine*, or ſome other excretion (*a*). The ſame alſo happens ſometimes to Women, whoſe *Menſes* do not flow; and thereby they are preſerved in *health*: Beſides, it muſt be obſerved, that Women have a *ſmaller Diaphoreſis* than Men, and that in thoſe who have a *plentiful Diaphoreſis*, as *Virago's* the *Menſes* do not flow at all, or at leaſt in a very ſmall quantity; but thoſe who have a *lax* and *cold habit* of Body, and live an *idle* Life, have the *Menſes* for the moſt part in *plenty*.

Theor. The nearer we are to our *origin*, the more the *preſſing force* of the Heart prevails, above the *reſiſtance* of all the Veſſels of the Body together; and this appears from the *increaſe* of Animals, which increaſe in a greater proportion in their tender years, than in a more advanced age: thus therefore that Body whoſe *bound* of it's increaſe is nearer to it's origin, ought, the reſt being equal, to have more *lax* and *ſoft* Veſſels, than that whoſe *bound* of it's increaſe is more remote from it's origin; ſeeing therefore Women come ſooner to the ἀκμὴ of their increaſe than Men, it is neceſſary, that their Veſſels ſhould be more *ſoft* and more eaſy to *unfold*.

(*a*) *Med. Static* 1. *Aphor.* 65.

6. It remains now to be examined, why the *ſuperfluous* Blood in Women is determined to the Womb. And it manifeſtly proceeds from hence, that in a Woman approaching to the bounds of her increaſe, there is no where *leſs reſiſtance* in the Veſſels, than in the *Abdomen*, hence alſo no where *leſs* than in the *Pelvis*, and there no where *leſs* than in the Womb: for Women, in proportion to their bulk, have their Abdomen much more *large* and *expanſile* than Men; for in their *Pelvis* are contained only the *Bladder* and *Rectum*; beſides which there is alſo the Womb in Women; add to this that their *Pelvis* is uſually more *capacious*, than would be required, with regard to it's contents. Beſides, when at any time the Bladder and the Rectum receive their liquids, and the Womb nothing at all, it appears from hence that there is the *leaſt reſiſtance* in the Womb. Moreover there is no part known in the female Body, into which the Blood flows from ſo many different places, as into the Womb; for *various* extremities of Arteries meet there in *one*, from *three different* Springs. To this may be added, that in the whole *uterine tract* the Veins are deſtitute of Valves, and that this want of Valves is not ſupplied by the compreſſion of the *Muſcles* that propells the *venal* Blood; for there is no part of the Body which has fewer *Muſcles* about it: all the Blood therefore, which is contained in the Veins, *reſiſts* the Blood coming from the Arteries; and thus whereſoever it is firſt in a ſomething *greater* quantity, it is preſſed immediately toward the *leſs reſiſting* places.

7. Now we know *three* kinds of *cauſes*, to which the *excretion* of the *menſtrual Blood* in a healthy Woman is owing; 1. A *Plethora*, 2. A determination of the *ſuperfluous* Blood to the Womb, as the *leſs reſiſting* part. 3. A *fitneſs* of the Uterine Veſſels

for *excretion.* *Emmenagogues* therefore may be reduced alſo to *three* Claſſes; of which the *firſt* contains thoſe which cauſe a *Plethora.* The *ſecond* thoſe which determine it to the Womb. And in the laſt place, the *third* includes *aperient uterine Topics.* Whoſoever therefore would cure a Woman labouring under a *ſuppreſſion* of the *Menſes*, ought firſt to inquire, whether there is matter to be *excreted*, or whether there is any *ſuperfluity* of Blood; for if this is wanting, the Medicines of the *ſecond* and *third* Claſs will do more harm than good.

8. A PLETHORA is produced; 1. By every Medicine which cauſes more *Chyle* to be received into the Veins, from the meat and drink, by the *power* of the firſt Bowels, than is required for the increaſe or nouriſhment of the Body, and to repair the loſs. 2. By every Medicine which ſo ſtrengthens and affects the ſecond Bowels, which are called *Hæmatopœa*, or *Blood-making*, that they turn the *Chyle* into good Blood. 3. By the *removal* of cauſes which attenuate and diſſipate the collected Blood. We have therefore *three* different kinds of *Medicines* contained under the *firſt* Claſs of *Emmenagogues*, or thoſe which cauſe a *Plethora.*

THE *firſt* of theſe kinds contains thoſe which increaſe the *force* of the firſt Bowels, or thoſe which are appropriated to *Chylification*; to which alſo are to be enumerated, 1. Thoſe which *diſſolve* the ſluggiſh *Fæces.* 2. Thoſe which *purge* them out, when *diſſolved*, by a *Stimulus.* For it is well known, that the cavities of the Inteſtines are always *lined* with a certain Mucus ſecreted there from the Glands; which if it is *thick*, and adheres, *obſtructs* the *orifices* of the ſmalleſt Veſſels, and ſo hinders the paſſage of the *Chyle* into the Lacteal Veſſels; whence ariſes an *Inanition* or *Atrophy*, which is contrary to a *Plethora.* Therefore if there is ſuch a Mucus, as to cauſe a *Plethora*, a *Plethora*, it ought, (α) to be *diſſolved*, and (β) *expelled:* wherefore I ſhall treat firſt of thoſe which *diſſolve* and *expel* this Mucus; and afterwards of thoſe which increaſe the *force* of the firſt *Viſcera*.

Those which *diſſolve* the ſaid Mucus, are, 1. Any aromatic fetid *Gums*, called *Uterines*; for theſe adhere by their *viſcoſity*, and mix themſelves by their *ſaponaceous power* with the *Pituita*, and *diſſolve* it, and at the ſame time ſtimulate and promote it's expulſion; and therefore *Gum Ammoniac*, *Aſa Fœtida*, *Bdellium*, *Galbanum*, *Myrrh*, *Sagapenum* and *Opopanax* are by all called *Uterines*; for theſe being taken are eaſily *diſſolved* by the heat of our Body, and whilſt they remain *diſſolved*, the *Acrid* which is contained in them exhales, and ſtimulates and gently deterges the *Viſcera:* they do not act therefore by any *power* directly appropriated to the Womb, but by their own *diſſolving* quality, being *ſaponaceous*, *aromatic*, and friendly to the Nerves. A Phyſician therefore, who would cure a Woman whoſe *Menſes* are ſuppreſſed for want of a *Plethora*, may preſcribe after this manner.

℞ *Gummi Ammon.*
Galbani
Sagapeni
Myrrhæ, *ana* ℈j.
Olei ſtillat. Succini rectif. q. ſ.
M.
Fiant inde Pilulæ.

TAKE of Gum Ammoniac, Galbanum, Sagapenum, *and* Myrrh, *each one Scruple*, *of* diſtilled Oil of Amber rectified *a ſufficient quantity*, *mix them*, *and make them into pills.*

These agree whereſoever the *entrance* of the *Chyle* is obſtructed by the cauſe juſt mentioned, as happens in hypochondriacal and hyſterical perſons; and they diſſolve the Mucus ſpoken of above. 2. All *fixed Salts*, whether they are prepared after Tachenius's method, or *alkaline*: which beſides have this peculiarity, that they ſoon paſs off; whence for a time their *effect* is great, but it ſoon ceaſes. Hither belong *compound fixed Salts*; as *Borax*, *Sal Ammoniac*, *Vitriol*, *Tartar*, *Sal polychreſtus*, *Sal regeneratus Sennerti*, *&c.* Thus alſo, take of either of theſe *Salts* ʒj. diſſolve them in ℥jv of *Rue-water*. Let the Patient take one ſpoonful after the pills. 3. All *alkaline volatile Salts*; ſuch as *oily volatile Salts*, *Spirit of Harts-horn*, *Spirit of Urine*, and *Spirit of Blood*. 4. All *Soaps* whatſoever: for they approach to the nature of Gum; wherefore *Soap* is much cried up for procuring Abortion and provoking the *Menſes*. Alſo to diſſolve the beforementioned Mucus,

℞. *Saponi Veneti* ʒjv
Bulb recent. Ari ʒj.
Aſæ fœtidæ ʒß.

Fiant Pilulæ, ſing. gran. iij. *Sumant ſingulis bihoriis unam.*

TAKE of Venice Soap *four drams, of* freſh Arum roots *one dram, of* Aſa fœtida *half a dram. Make this maſs into Pills of three grains each; take one every two hours.*

These are *Deterſives* of the firſt paſſages. Now follow thoſe which expell the *diſſolved Mucus*: ſuch are *Aloës*, *Rhubarb*, *Coloquintida*, *Jalap*, *Sagapenum*, *Opopanax*, and above all *white Bryony*. Phyſicians have given the name of *Uterines* to theſe, from their effect, becauſe they at the ſame time *diſſolve* and *expel*. To this purpoſe therefore the following preſcription is to be given.

℞. *Aloës opt.* ʒj.
Reſin. Jalap. gr. xv.
Colocynth. gr. v. (*pro* ſtimulo.)
M.

Fiant Pilulæ, ſing. gr. iij. *quæ deaurentur. Capiat ex iis ſub Aurora, ubi adſunt ſigna ſolutæ pituitæ*; *&* *dormiat per horam unam vel alteram.*

TAKE of the beſt Aloës *one dram, of* Reſin of Jalap *fifteen grains, of* Coloquintida *five grains, for a* ſtimulus; *mix them and make a maſs, of which make Pills of three grains, and gild them. Take of them early in the morning, where there are ſigns of* diſſolved Pituita; *and ſleep an hour or two after them.*

Now let us ſee, what give a *greater force* to the Bowels, ſo that they may make good *Chyle*, and propel it into the Lacteal Veſſels. The *force* therefore of the firſt Bowels is increaſed, namely by increaſing the *contractile force* of them, by all thoſe which make the Fibres more rigid: ſuch are *aſtringent* Medicines, as 1. *Steel*; for nothing is of more ſervice in this caſe, eſpecially if it be given under ſuch a form, as not to mix with the Blood, but to act on the Solids, by corroborating the *Fibres*; for if it is mixed with the Blood, it becomes highly *coagulating*: but being taken with the *regimen* mentioned above, it acts very well, and ſtrengthens the *Fibres*; as is manifeſt from this, that after the *uſe* of it, the *pale* colour of Virgins is ſoon turned to *red*, and the Pulſe, which before was *languid*, to an almoſt *feveriſh* one. But the *uſe* of it obtains, when a due *rigidity* of the Bowels is wanting, and there is a plenty of *Pituita*: moreover, if an *Acid* abounds, then it may be taken in *ſubſtance* or *filings*; but if a *ſluggiſh* and *not acid* Mucus predominates, the *Steel* may be given in Rheniſh Wine or Vinegar; other preparations are mere trifles. Beſides hither belongs, 2. The *Peruvian Bark*, in whatſoever form it is given; and here it obtains the next place to *Steel*. 3. *Rhubarb* and *Rhaphontic*. 4. *Tamariſk*, and eſpecially the *Bark* of it's root. 5. *Caper*: and various compounds of it. Hence thereſore it appears, that the greateſt *Aſtringents* may become *Emmenagogues*.

Now follow examples for *forms*. If an *Acid* predominates, it may be known by an *appetite* to improper and unuſal things, *ſower eructations*, *gripes* with a ſenſation of cold, *nidorous eructations* after taking Vinegar. In this caſe therefore,

℞. *Limat. Ferri* (*ſupra porphyritim diu trit.*) ʒij.
Extract Rhei ʒj.
Cort. Peruv. ʒß.
M.
Fiant Pilulæ, ſing. gr. v. *Capiat unam omni bihorio.*

TAKE of Filings of Steel (*ground a long time on a Porphyry ſtone*) *two drams*, *of* Extract of Rhubarb *one dram*, *of* Peruvian Bark *half a dram*. *Mix them, and make Pills, each of five grains. Take one of them every two hours.*

BUT if the *Acid* does not abound, then *Steel* it ſelf given *in ſubſtance* for the moſt part excites anguiſhes, vomitings, *diarrhœas* and gripings; for it is not *diſſolved*, but acts only by *ſtimulating*. In this caſe therefore,

℞. *Vin. Rhen.* ℔ iij.
Chalybis contrit. ℥ij.
Cort. Peruv. ℥j.
Leni tepore macerentur per 24 *horas; deinde vacuo ſtomacho* ter *de die una hora ante paſtum, ſumatur ex hoc* ℥jß.

TAKE of Rheniſh Wine *three pints, of* Steel in powder, *two ounces, of* Peruvian Bark *one ounce, macerate them in a gentle heat for four and twenty hours; and then take an ounce and half,* three *times a day, on an* empty *ſtomach, an hour before* eating.

HITHER alſo belong thoſe warm and ſtimulating *Aromatics*, which afford a great deal of *very acrid Oil* by diſtillation; as *Thuya* or *Arbor vitæ*, *Savin*, *Rue*, eſpecially the *mountain Rue*, *Roſemary*, *Penny-royal*, *Marjoram*, *Feverfew*, *&c.*

THE *ſecond* kind of Medicines cauſing a *Plethora*, are thoſe which increaſe the *Blood-making power* in the Heart and Blood Veſſels. Now that *power* is no other than the *oſcillatory force* of the Veſſels: and this is increaſed by the ſame Medicines, which have been already preſcribed for the Veſſels of the firſt kind, or thoſe which ſerve for *Chylification:* all therefore which promote *Chylification*, are ſufficient alſo to promote *Sanguification*; for it is impoſſible for the *firſt paſſages* to be amended, without amending the *ſecond*; or for the *ſecond* to be amended without *amending* the *firſt*. But hither alſo ſhould be added the *motion* of the Body in a free Air.

THE *third* kind of the ſaid Medicines includes thoſe which hinder the too great *conſumption* and *diſſipation* of the collected Blood. Therefore we ſhould avoid whatſoever excites ſweat or *too great* perſpiration.

9. The *ſecond* Claſs of *Emmenagogues* contains thoſe which determine the *plethoric* Blood to the Womb: and ſuch are all that diminiſh the *reſiſtance* in the uterine Veſſels, and at the ſame time increaſe it in the others. But the *reſiſtance* of the uterine Veſſels is diminiſhed *two ways*; 1. By *relaxing* thoſe Veſſels: 2. By *accelerating* the *reflux* of the Blood from the lower Veins toward the Heart. I therefore divide the Medicines of this *ſecond* Claſs into *two* kinds.

The *firſt* contains thoſe which *relax* the uterine Veſſels: ſuch as, 1. All *warm Baths*, applied as far as to the Navel; for by this means the Veſſels of the lower parts are *relaxed*, whilſt the Veſſels of the upper are *conſtringed* by the coldneſs of the Air; eſpecially if thoſe upper parts are placed in a cool Air. 2. Any *external* heat, applied to the lower parts. 3. *Ointments*, which conſiſt of fat, oily and ſaline Aromatics; ſuch as *Unguentum nervinum*, *Martiatum* and *Arthriticum*: for ſuch being laid to the Feet, Legs and Groin are very ſerviceable. Hither alſo belong relaxing and warming *plaſters*, and eſpecially thoſe which are prepared of the *fetid Gums*; which *relax* the Veſſels, and at the ſame time reſtrain the *perſpirable humour*, whence a greater *heat* ariſes under the form of a continual *Bath*. Hither alſo belong the *uterine Plants*; among which the beſt are *Rue*, *Savin*, *Juniper*, *Arbor vitæ*, *Marjoram*, *Penny-royal*: of which may be made Baths, Cataplaſms, Ointments, and Plaſters.

The *laſt* kind of Medicines of the *ſecond* Claſs includes thoſe which accelerate the *reflux* of the Blood from the lower Veins toward the Heart: ſuch as the following: 1. All *Frictions* continued from the bottom of the Feet to the Groin, and that by warm and dry linnen cloths, for half an hour every time. 2. *Walking*; for the *tibial*, *crural* and *femoral* Muſcles compreſs their Veins by frequent action, and propel the Blood toward the upper parts. 3. The *motion* of *leaping*; which indeed is of ſo much conſequence, that HIPPOCRATES ſays it will procure *Abortion*. But all theſe provoke the *efflux* of the *Menſes*, by removing the *reſiſtance* in the Veins: for when this is removed, the Blood flows in a *greater* quantity toward thoſe parts; whence there is a *greater preſſure* of the Blood into the *lateral* Veſſels; and hence follows the *excretion* of it.

10. THE *third* Claſs of *Emmenagogues* contains thoſe which diſpoſe the uterine Veſſels to *excretion*: ſuch as *vapours of fair warm Water* applied to the lower parts of the Body. 2. *Relaxing Fomentations* applied by means of ſponges or linnen cloths to the Groin, *Perinæum*, *Vagina*, *Hypagaſtrium*: hither alſo belong *Cataplaſms*, *Plaſters*, *Peſſaries*, and ſuch like, conſiſting of *Relaxers*; the materials of which may be taken from the former doctrine of *relaxing* Medicines. 3. Here a *vapour* of ſome *Acrids* is much commended; as of *urinous Alkaline ſalts*, received into the Womb, which however is not without danger, for it irritates vehemently, and cauſes a great contraction in the uterine *Fibres*; ſuch a *vapour* therefore ought to be cautiouſly applied, for it often makes the Womb *barren*, and produces horrid contractions and ſpaſms; for that *vapour* is moſt *acrid*, and inflames the Womb, whence a *Gangrene* or *Schirrhus* may eaſily ariſe; and if the Womb is violently inflamed, the whole nervous ſyſtem is affected with ſpaſms: wherefore if ſuch a *vapour* is ever uſed, there ſhould be great care taken, that it be not too *acrid*; let that *vapour* therefore ſuffice,

which exhales from a ſmall quantity of *Spirit* of *Sal Ammoniac* and a great quantity of *Water* mixed and made warm; but by no means let that *very acrid vapour* be uſed, which a certain Empiric was accuſtomed to prepare for this purpoſe; namely a mixture of Urine and quick Lime ſet over the Fire.

COROLLARIES.

I. HENCE it appears, that *Ariſtolochics* are *Uterines* of the *third* Claſs; for there a *Plethora* is ſuppoſed to be already preſent, and alſo a *determination* toward the Womb; for otherwiſe there is no occaſion to move the *Lochia.*

II. *ECBOLICS* are the ſame, but *ſtronger*; to which if *Sternutatories* are added, then they act moſt ſtrongly.

III. *ABORTIVES* are thoſe which *open* the Womb, and *expell* the Fœtus and Placenta: ſuch are 1. *Too great a quantity* of Blood. 2. All that *determine* ſtrongly to the Womb. 3. Thoſe which violently *conſtringe* the Womb: hither alſo is to be referred a *vapour* of *Sal Ammoniac*, received into the Womb of a *pregnant* Woman; than which there is not a more powerful *Abortive*; but the danger of it is great, as was ſaid above.

IV. ALL *Ecbolics* and *Abortives* are to be given with great caution; for they all do *harm* to the Body, and are very dangerous, not only to the *Fœtus*, but alſo to the Mother.

The Third CLASS

Of ſome other MEDICINES *which act on the* SOLIDS *and* FLUIDS *together.*

CHAP. I.

Of APERIENTS.

1. *APERIENTS are thoſe Medicines which open the obſtructed paſſages.* Of theſe there are *three* Claſſes, of which the *firſt* contains all that relax the Veſſels; of which before. The *ſecond* contains thoſe which attenuate, reſolve, and dilute the Liquids; of which alſo I have treated already; laſtly, the *third* includes whatſoever, after the Veſſels are relaxed, and the Liquid attenuated, drive both into *motion*, and promote the Circulation.

2. FOR to *open* any *obſtructed* Veſſel, theſe *three* things are neceſſarily required; 1. That the Veſſels be relaxed. 2. That the obſtructing matter be reſolved, or at leaſt diluted. 3. That the Circulation be promoted in this Veſſel.

COR. HENCE therefore it appears, how raſhly ſome aſſert, that there are *ſpecific Aperients*; ſuch as *Scordium*, *white Horehound*, *Spirit of Sal Ammoniac*, &c.

CHAP. II.

Of DISCUTIENTS.

1. *DISCUTIENTS are thoſe which diſſipate the Liquid, either in the Veſſels, or extravaſated, ſtagnating or coagulated without any ſenſible ſolution of continuity in the external parts.* Now theſe are ſo many as there are different cauſes of ſtagnation or extravaſation.

2. A LIQUID *ſtagnates* in the Veſſels, and becomes a tumour; 1. From a *Plethora*; and then the tumour appears *red:* in which caſe the beſt *Diſcutient* is the evacuation of the Liquid which preſſes behind upon that which *ſtagnates*; hence therefore *bleeding* may remove theſe *red* tumours. 2. Such a tumour ariſes from inflammation: and then the true *Diſcutients* are (α) whatſoever relaxes the Veſſels. (β) Every thing which variouſly moves the relaxed Veſſel, by applying ſuch moving powers as are very contracting and dilating; this is done by *bleeding*, and external *Frictions.* (γ) Whatſoever revulſes, reſolves, attenuates, and dilutes the Liquids, by emptying the Veſſels. 3. A tumour derives it's origin from the thickneſs of the gathered or coagulated Liquid; and this is *diſcuſſed* only by an *aperient* Medicine.

3. EXTRAVASATED Liquids are alſo *diſcuſſed*, when they are driven again into their own Veſſels: and this is obtained, 1. By freeing the abſorbent Veſſels, as much as poſſible, from the diſtending

Liquids ; and theſe abſorbent Veſſels, which were ſpoken of before, in PROLEG. CAP. V. were diſcovered by VIEUSSENS, by the help of Microſcopes, in many of the Bowels, and end in Veins after the ſame manner as the Excretory Veſſels ariſe from the Arteries : conſult this AUTHOR's *Novum Vaſorum Corp. Hum. Syſtema, page m.* 23. *& ſeq.* Now this may be done by copious *bleeding*, or by the uſe of *Hydragogues*, where *bleeding* is not proper : which *two* do not weaken in this caſe, but rather reſtore ; whence at that time they are of great ſervice, provided they can be adminiſtred together. 2. The ſame is obtained by means of all *Aperients.* 3. By an *external*, or *preſſing*, or *drying power*, applied to the Body. Moreover, it is to be noted, that *Diſcutients* are of no force againſt *Schirruſes.*

CHAP. III.

Of EMOLLIENTS.

1. AN *Emollient is every thing that reduces any part of our Body, that is indurated, and compacted into one maſs, to it's former ſtate of a contained Liquid and a containing Solid.* Induration happens in our Bodies principally after *three* ways ; 1. By a *too great coction* and *preſſure* of the Liquids ; for by this means the more fluid parts are expreſſed, and the thicker are driven into a more compact maſs ; whence it happens, that the Veſſels being partly emptied, in a very ſhort ſpace of time, concrete and conſolidate into one ; or the thick Bodies ſtagnating or being impacted,

concrete with their Veſſels. 2. By a *coagulum* which ariſes from the proper nature of the Liquids: now that there may be ſuch a *coagulum* appears from the *white of an egg*, which is *coagulated* by the Fire, tho' it remains incloſed in the ſhell. 3. By a ſuper-induced *coagulum* by the mixture of any *coagulating* Body.

2. *EMOLLIENTS* are either *internal* or *external*. Thoſe which we call *internal*, are, 1. Thoſe which are uſed under the form of *Halituſes* or *Fumigations*, either drawn in or injected: ſuch is *Water* diſſolved into a *vapour*, than which nothing is more *Emollient*; but it ſhould not be too *hot*, for then it *conſtringes*; but moderately *warm*, and then it is the greateſt *Emollient*; as appears in Bones and Horns *philoſophically calcined*; which are more *ſoftened* by vapour than by boiling. 2. *Emollients* which are taken *inwardly* are *Broths* prepared of all parts of Animals, and eſpecially of the Meſentery and Inteſtines. 3. *Raw yolks of eggs*; which diſſolve Reſins and Gums, though they have no *Acrimony* in them. 4. Any *decoctions* of mild farinaceous ſubſtances, eſpecially of the *frumentaceous*; which being expreſſed afford a moſt mild *Oil*, reſembling the *Oil* of ſweet Almonds in it's mildneſs: ſuch are *Rie*, *Wheat*, *Oats*, *Barley*, *Millet*, *Piſtachios*, but eſpecially the meals of all theſe: alſo the *four* greater and leſſer *Cold ſeeds*. 5. *Decoctions* of mucilaginous and mealy herbs, almoſt inſipid: ſuch herbs are all the ſpecies of *Mallow*, *brank Urſine*, *Mullen*, *Pellitory*, *Mercury*, *Violets*, *Liquorice*, *red Poppy*, *Soapwort*, *&c.* which are all known by the viſcidity of their juice. 6. *Decoctions* of like ſweet mucilaginous Fruits: ſuch as *Figs*, *Sebeſtens*, *Raiſons*, *Currants*. 7. *Juices* of plants that are not acrid: ſuch as *Honey*, *Sugar*, *Caſſia*, *Manna*. 8. *Expreſſed Oils*, almoſt inſipid: as *Oil of ſweet*

Almondst,

Almonds, *Coco Nuts*, *Piſtachios*, *white Poppy ſeeds*, *Henbane ſeeds*, *Olives*, *Linſeed*, *Walnuts*, *&c.*
9. Sweet *Cream*, and freſh *Butter.*

3. *EXTERNAL Emollients* are the ſame; but they are applied in form of a Liniment, Ointment, Fomentation, Bath, Vapour, Cataplaſm, Plaſter, Embrocation.

LINIMENTS are made of a fat, chylous, marrowy, compacted ſubſtance, rubbed on the Body, as of the *marrow of Bones*, *&c.*

OINTMENTS are thicker Liniments; conſiſting of ſome Oils and Fat.

FOMENTATIONS are decoctions applied warm to the Members by ſpongy Bodies.

CATAPLASMS are *Emollients* boiled in Water, and applied to the Body.

PLASTERS are of the ſame kind, but reduced to a thicker conſiſtence.

EMBROCATIONS are a kind of Fomentation, when the fomenting Liquor is let fall by drops on the part to be fomented.

Of all theſe *Emollients*, there is none better than the *warm vapour* of an Animal *newly killed*; for example, if an Arm or other Member, is put naked into the Body of any Animal *newly killed*, which remedy is no where more in uſe than in *Italy* (*a*).

(*a*) Our Author no doubt alludes to that memorable *caſe*, which the Hiſtorians relate of *Pope* Alexander VI. and Cæsar Valentin Borgia *his natural Son*; who having a deſign to deſtroy ſome *Cardinals*, whoſe wealth they longed for, by *poiſoning* them at an entertainment, it happened, by a miſtake of the Cup-bearer, that the *poiſoned Wine* was drank by the *Poiſoners* themſelves: upon which it happened, that Alexander ſoon died; but the Phyſicians ſaved Cæsar, who had drank leſs liberally of it, by the adminiſtration of ſeaſonable remedies; and eſpecially by *incloſing* him naked in the *Belly* of a *Mule juſt killed*: by which *fomentation* his Skin was ſo

But all theſe have this good on them, that they are applied to *indurated* places, yet they are never *noxious*, ſeeing *Aperients*, *&c.* often increaſe an inflammation, and generate *Schirruſes* and Cancers.

CHAP. IV.

Of Aſtringents and Induraters.

1. Of theſe Medicines, and alſo of *Corroboraters*, we have treated already in the hiſtory of Medicines, *which operate on the Solids*, under the title of *Contracting Medicines*; and in the hiſtory of thoſe *which act on the Fluids*, under the title *Condenſants*, *Incraſſants*, and *Coagulaters*. In this place *Aſtringents* are conſidered, ſo far as they increaſe the *contractile force* of the Veſſels, and at the ſame time *inſpiſſate* the Liquids: of this ſort are all *unripe fruits*; for theſe *ſhorten* the Fibres, and *condenſe* the Liquids.

2. Those

ſo *ſoftened*, and ſuch a *Diaphoreſis* promoted at the ſame time, that the *Poiſon* went out, being *diſſipated* by the orifices of the cutaneous Pores, that were every where open; and ſo that Prince eſcaped *death*, but he loſt all his *Hair* and his *Skin*, and was thereby for a long time *afflicted* with a troubleſome diſorder. Conſult Oldoinus, *in Addit. ad* Ciaconium, *Hiſtor. Pontif. Rom. & Cardin. Tom. III. page m.* 161 *&* 162. The Reader may conſult other Authors alſo on this ſubject, as Guicciardin, Auberius, Mariana, *&c.* See alſo Marc. Aurel. Severinus, *in Trimembr. Chirurg. Cap. de Medela ex diſſectis vivis Animantibus, pag. m.* 221. A like caſe is related by Rhodius, (*Obſerv. Medic. Centur. III. Obſ.* 37.) of the *Marquis* Franc. Alvaroti, who had drank Wine poiſoned with *corroſive ſublimate*, and preſerved after the ſame manner as Cæsar Borgia.

2. THOSE alſo which are called *indurating* entirely agree with *Aſtringents*, and are of the ſame nature; and therefore it is not neceſſary, that we ſhould ſay any thing about them. But now we muſt treat of *Detergents*, *Emundants*, and *Erodents*.

CHAP. V.

Of Detergents, Emundants, and Erodents.

1. *DETERGENTS are thoſe, which being applied to the Body can remove any foreign Body that adheres, without injuring the Body to which it adheres.* We call that *foreign*, which cannot conſtitute *one* Body with that to which it *adheres*; ſuch as a grume of Blood ſticking to the ſides of a Wound: but this *adheſion* ought to depend on *tenacity*; for a Dart or a Spine *ſticking* to any part does not in the leaſt belong hither.

THE object therefore of a *detergent* Medicine muſt be ſomething *tenacious*; which neceſſarily conſiſts of an *indurated* Oil, for other *indurated* or *coagulated* Bodies do not adhere becauſe of their *viſcoſity* and *tenacity*. Thus therefore a *Detergent* ought firſt to divide that *tenaciouſneſs*, and then reduce it to ſuch a ſtate as to be *diſſolvable* in Water, and capable of being waſhed away by it; but as it is Oil, it cannot be *waſhed away* by means of Water alone; but if it be firſt rubbed with the yolk of an Egg, it may afterwards be eaſily mixed with Water, and brought out.

Hither therefore belong all *ſaponaceous* Bodies, and *Lixiviums*, that are very *alkaline*; for thoſe *two* ſo diſpoſe the *tenacious* Body, as to make it mix with the Water. Moreover all Oils mixed with Salts are *ſaponaceous*; but if theſe are given *internally*, they ought to be *mild*, for otherwiſe they will *erode:* they are of two ſorts namely, 1. *Native:* among which the principal are, *Honey*, *Aloës*, *Manna*, *Caſſia*, *Sugar*, every *mild milk* of Vegetables, as of *Lettuce*, *Succory*, *Dandelion*, *Scorzonera*, and the *juice* of *Soapwort.* Hither alſo belongs the *Bile* of Animals; which is of excellent uſe in deterging glutinous and ſordid Ulcers. Hither alſo belongs the *yolk of an Egg*; which is the beſt, if it be mixed with a little *Bile.* 2. *Artificial:* as *Venice Soap*, and *black Soap*, *Sal volatilis oleoſus*, *Sal regeneratus* SENNERTI, *tincture of Tartar*, with *fixed Salt* and *Spirit of Wine*; alſo *Elixirs* compounded with *alkaline Salts* and *Water.*

2. *EMUNDANTS are thoſe, which deterge and waſh away at the ſame time, by an aqueous vehicle.* Hither therefore are referred all which melt what *adheres*, and dilute and expel it by an *aqueous vehicle.*

3. *ERODENTS are thoſe which reſolve not only the adhering tenacious Body, but alſo the half corrupted ſcraps of the Veſſels, even to live fleſh:* but they ought to leave the live fleſh *untouched*, otherwiſe they would be properly *Cauſtics.*

The following therefore are *Erodents*; 1. All that *excite pain*, which have been deſcribed already. 2. *Attenuants*, *Reſolvents*, *Putrefiers.* But if any malignant Ulcers (which always are *ſeated* in the fat, becauſe they eaſily creep there, and are called phagedenic) are to be cured, we can do nothing in them, unleſs the Liquids are greatly moved and expelled by *internal* Medicines, and the ſeparation be made by *external Corrodents*; of which the chief are the *Mercurial Precipitates*, laying a *warming* plaſter over them: the next day take away what is putrified, and apply the *Precipitate* anew, 'till all are conſumed that ought to be conſumed; that is, till all the infected Glands are taken away: but if any one does not care to uſe *Mercury*, on account of the *ſtink* that is occaſioned by it, then *volatile urinous Salts* may be uſed, with *copper* diſſolved in them; therefore let the Ulcer be touched with this ſolution, which is very good; or inſtead of it with *Elixir Proprietatis* prepared with Salt of Tartar and fair Water.

CHAP. VI.

Of HEATERS.

1. A *HEATER is that which increaſes the heat of the Body.* But that we may the better underſtand the manner of it's operation, I ſhall premiſe ſome things *concerning heat in general.*

2. WHATSOEVER of cold becomes hot, is *heated* either becauſe *fire* is actually applied to it, or becauſe a *motion* is cauſed in it by attrition. There are *three* things neceſſary to produce heat by *attrition*; namely, 1. The *contact* of Bodies, 2. The *motion* of Bodies. 3. The *preſſure* of Bodies to each other. And unleſs all theſe *three* concur together, heat cannot be produced; for the *contact* of Bodies without *motion* and *preſſure* or *attrition*, does not make heat; but a *ſlight attrition*, that is, without a notable *preſſure* of the Bodies to each

other, excites no heat, or at leaſt not any that is ſenſible.

3. Hence therefore it follows, 1. That the more points the Bodies that make *attrition* touch one another in, or which is the ſame, the greater their ſurfaces are, according to which they touch one another, the reſt being equal, the greater will be the heat excited by *attrition.* 2. That the more violent the *motion* of the Bodies that make *attrition*, being repeated at ſhort intervals and long continued, is, the greater will be their heat, the reſt being equal. 3. That the greater the *force* is, by which theſe Bodies are applied to each other, in like manner, the more their heat increaſes. To theſe *three* Axioms, for that they are ſuch, any one who attends to them will eaſily perceive, I ſhall add a *fourth* which has been univerſally confirmed by experience; 4. That the more *ſolid*, the more *hard*, the more *elaſtic* any Body is, the reſt being equal, the ſtronger it's heat is, by the *application* of actual Fire, or by the *attrition* of another Body.

4. But our Body may be *heated* either *externally* or *internally*. But heat is excited in our Body *externally*, 1. By the application of *Fire* or any other *hot* Body. 2. By *friction* and *attrition.* And heat may be excited *externally*, 1. By the exciting of *external* heat. 2. By the *attrition* of the Solids againſt each other; alſo by a like *attrition* of the Fluids againſt each other. Moreover the ſolid parts may ſuffer *attrition* againſt each other in all the Joints; but as in them, beſide the *bound* and *binding* parts, there are alſo *lubricating* Liquids, which lie between the parts; it is very manifeſt, that ſo long as *that* Liquid is at hand, the heat cannot be ſo increaſed by *attrition*, as to become morbid: but as ſoon as *that* Liquor fails,

then the heat increaſes too much, by the *attrition* of the ſolid parts; as in the Gout, Rheumatiſm, Scurvey, *&c.* 3. Heat may be excited by the mutual *action* of the Solids and Fluids on each other.

THEOR. I. IF the *velocity* of the projectile motion is increaſed in our Body, the Veſſels and Liquids remaining the ſame, the heat alſo will be increaſed by AXIOM. 2 and 3. Hence therefore whatſoever increaſes the *velocity* of the circulation, is a *Heater*; and therefore the *firſt* Claſs of *internal Heaters* contains all thoſe which *increaſe* the circulation, either by ſtimulating the Solids, or moving the Liquids: ſuch are all *Acrids*; hence Spirit of Wine, ſo far as it ſtimulates, is a *Heater*.

COROLL. I. IF the heat be increaſed in our Body, the Veſſels and Liquids remaining the ſame, it plainly indicates, that this projectile motion is increaſed.

THEOR. II. IN our Body, the Veſſels and projectile motion remaining the ſame, if the *thickneſs* of the Liquid is increaſed, the heat alſo will be increaſed by AXIOM. 2, 3, and 4. The *ſecond* Claſs therefore of *internal Heaters* contains thoſe which *condenſe* the Fluids: hence alſo cold *heats* the more, as it *acts* the more, if it does not ſupreſs all *motion*; for it *condenſes* our Liquids: therefore after great *external* cold, there always follows a greater *internal* heat; and HIPPOCRATES has obſerved, that *Bellies*, or *Cavities* containing Liquids, *are hotter in Winter and Spring than in Summer* (a).

COROLL. II. IF the heat be increaſed, the Veſſels and projectile motion remaining the ſame, it plainly indicates, that the *thickneſs* of the Liquids is increaſed. The proper remedies therefore are the *rarefying*.

(a) *Aphoriſm. ſect.* 1. *Aphor.* 15.

THEOR. III. IN our Body, the Liquids and projectile motion remaining the ſame, if the Veſſels are *ſtraitened*, the heat will be increaſed by AXIOM I. Hence alſo the *third* Claſs of *Heaters* contains, 1. All that *compreſs* the Veſſels; ſuch as *ſtrait cloaths*, *thick bedding*, *heavy Air*, *cold Water*, and *cold Air*; therefore whoſoever is ſubject to Hæmorrhages, ought to avoid them, as much as poſſible. 2. Thoſe which *contract* the Veſſels. (See the *Chapter* of *Contracting Medicines.*) 3. Thoſe which *bind* the Veſſels *externally*; provided they do not hinder the *motion* of the Blood.

COROLL. III. IF the heat is increaſed, the Liquids and projectile motion remaining the ſame, the Veſſels muſt neceſſarily become *more ſtrait*: hence the Liquids being very much diminiſhed, the heat may remain in ſome *diſeaſes*, as in a *Conſumption*; for all hectic Perſons are dried by the heat, whence their *Fibres* become moſt rigid and moſt contracted, and becauſe of the *maraſmus*, many of their Veſſels *fall together*, and therefore in the reſt of the Veſſels the Fluid is greatly *ſtraitned*, though this alſo is diminiſhed.

COROLL. IV. IF the *velocity* of a Liquid and it's *bulk* be at the ſame time increaſed, the reſt remaining the ſame, the heat will be in a *proportion compounded* of both; and in general, if any *two* of theſe be increaſed, the *third* in the mean time remaining the ſame, then the heat will increaſe in a *proportion compounded* of the two that are increaſed.

COROLL. V. IF the *velocity* and *bulk* of a Liquid, and at the ſame time the *ſtraitening* of the Veſſels be increaſed, a *very great* heat will ariſe.

CHAP. VII.

Of COOLERS.

1. COLD *is excited in our Body by cauſes oppoſite to Heaters.* Therefore *external* cold is cauſed, 1. By the application of *cold* Bodies: and theſe, as Experience teaches, *cool* the more, as they are more *ſolid*; for thus *cold* Water *cools* more than *cold* Air; and Baths of *fair* Water *cool* leſs, than thoſe which are made of *ſalt* Water. Hither alſo are referred *Winds* and *Fans*; which *cool* the Body ſo far as they remove that part of the atmoſphere which immediately ſurrounds us, and ſubſtitute another; for that part of the atmoſphere which immediately ſurrounds any *hot* Body, is always *warmer* than the more remote parts of it. 2. By taking away the *attrition* of all externals on our Body.

2. Now *internal* cold is, 1. From *external* cold. 2. By removing or diminiſhing the mutual *attrition* of the *internal* parts, both Solids and Fluids: therefore there cannot be a *greater* cold given to our Body, abſtracted from external cauſes, than that which is produced by *death*.

THEOR. I. In our Body, the Veſſels and Liquids remaining the ſame, if the projectile motion be diminiſhed, the heat alſo will be diminiſhed or the cold increaſed by the ſecond AXIOM of the preceding CHAPTER, *ſect.* 3. Hence therefore the *firſt* Claſs of *Coolers* contains thoſe which *diminiſh* the projectile motion: but this depends on the *contractile force* of the Solids, and that on the *Stimulus* applied to the Solids; for the greater the *motion* is, the greater is the *force* of the Solids, and on the contrary. Whatſoever therefore deſtroys the powers of *Stimulaters*, is to be accounted a *Cooler*: ſuch therefore are the following; 1. All *Diluters*; ſuch as *Whey*, *Water*, *Milk and Water*, *&c.* all which, if they are taken *warm*, a:t the better, by penetrating and relaxing. 2. *Obtundents*; or thoſe which break an *acrid Stimulus*; ſuch as any *Acids* with regard to *Alkalines*, and *Alkalines* with regard to *Acids*: hence if heat ariſes from an *Acid*, as often happens in hypochondriacal Perſons, then *Alkalines* will be *Coolers*; but if an *oily Acrid* is the cauſe of *heat*, then *ſaponaceous Acids* will be *cooling*, ſuch as the *juices* of ſeaſonable Fruits freſh ſqueezed; nay and *lime* diſſolved in Water is a *Cooler*, with regard to *oily Alkalines*. 3. *Involvents*; namely thoſe which involve a *ſtimulating Acrid*: of this kind are all gelatinous, farinaceous, terreſtrial Fat, mild *Oils* of Vegetables; hence *Ptiſans* prepared of ſuch *cool* excellently. 4. *Expellents*; namely thoſe which ſhake off an *impacted Stimulater*, and derive it without the Body: therefore in this caſe *Coolers* are thoſe, which being condered by themſelves are *heating*; as *Purgers*, *Vomitories*, *Diuretics* and *Diaphoretics*.

Theor. II. In our Body, the reſt being equal, if the Veſſels are *leſs elaſtic*, a *cooling* will ariſe by Axiom 2, 3, and 4, above. The *ſecond* Claſs therefore of *Coolers* contains *Relaxers*; and thence a reaſon may be given why Baths *cool.*

Theor. III. In our Body, if, the reſt remaining the ſame, the *denſity* of the Liquid be diminiſhed, the heat alſo will he diminiſhed by Axiom 2, 3, and 4. Now the *denſity* of a Liquid is diminiſhed by attenuating and diluting. The *third* Claſs therefore of *Coolers* includes *Attenuants* and *Diluents*: ſuch are all *watery* Bodies, and alſo *Nitre*, which greatly attenuates, hence all *nitrous* Plants are here the beſt. Thence it appears why in inflammatory diſeaſes, when the Blood is the *thickeſt*, *Attenuants* are ſo much extolled.

THEOR. IV. IN our Body, all the reſt remaining the ſame, if the Veſſels are rendered more *capacious*, the heat will be diminiſhed by AXIOM I. Therefore the *fourth* Claſs of *Coolers* contains all thoſe which increaſe the *capacity* of the Veſſels: ſuch as *Moiſteners*, *Relaxers*, *Aperients*, *Deobſtruents*. And hence it appears, why a ſtorm of *thunder*, which renders the Air *light*, is often immediately ſucceeded by *cold*. Thence alſo it is manifeſt, why thoſe who wear *looſe* garments, or lie in bed with *few* cloaths, are *cold*; alſo why Men who have *lax* Veſſels, as alſo fat perſons and Women, are for the moſt part *colder* than others.

CHAP. VIII.

Of Attractives or Drawers.

1. *ATTRACTIVES or Drawers are ſuch as tranſpoſe any thing that ſticks in our Body, by drawing it from the place where it ſticks into another.* But to do this, there are three things neceſſary; 1. That the matter be rendered *penetrable* or *fit* for *motion*. 2. There are *cauſes* required which may *drive* the matter being rendered *penetrable* into the deſtined place, or which being applied to the deſtined place may *draw* the matter to the ſame place. 3. It is required that the intermediate paſſage be *free*, by which the matter

being *drawn* or *repelled* may come to the deſtined place, without hindrance.

2. Hence therefore there are *three* Claſſes of *attracting* Medicines, which follow.

I. The *firſt* Claſs contains all thoſe which render the matter *penetrable*: as 1. Whatſoever *ſtimulate* the Solids; of which hitherto. 2. All that render the matter *moveable*: ſuch as *Attenuants*, *Reſolvents*, and *Diluents*; of which alſo I treated above.

II. The *ſecond* Claſs contains all thoſe which produce a *motion* and *tranſlation* of the matter rendered *penetrable*: ſuch as, 1. Whatſoever *drive* the matter from the place where it was to be moved, into a determinate place; as (α) The *force* of the Heart and Arteries. (β) The *motion* of Friction, and Compreſſion in the Veſſels which are deſtitute of *valves*; thus by means of *conſtriction* the tumours are transferred from place to place. All that diminiſh the *reſiſtance* in the place, into which the matter is to be moved: ſuch as (α) The *opening* of a Vein or Artery; thus we may evacuate the whole maſs of Blood by one Artery: moreover *Scarifications*, *Iſſues*, *Setons*, *Fiſtulas*, *Cauteries*, and all ſuch *erodent* remedies conduce to this end, by taking away the *reſiſtance*. (β) *Friction*; which takes away the *reſiſtance*, ſo far as it promotes the *motion* of the Blood through the Veins. (γ) Whatſoever takes away the *preſſure* in the place of the external Air; as *Cupping-glaſſes* and *Suction*: hence Hippocrates adviſes to apply broad and large *Cupping-veſſels* in a Pleuriſy; that all the inflammation may be derived to the Skin. (δ) *Emollients* or *Relaxers*; of which hitherto. 3. All *ſpecific drawers*: ſuch as *venomous* Animals, which being applied either living or dead to the Body, are ſaid to *draw* to themſelves the *venom* of their own nature; thus a *Scorpion* being cruſhed upon the wound which he has made, and a *Toad* being applied, either alive or dead, draw out their own *venom:* thus the *fleſh* of a mad Dog being *applied* to the wound which he has made, before the *poiſon* has ſpread it's ſelf too far, *cures* ſome that have been bitten: thus alſo the *Serpent-ſtone*, if it be *applied* to a wound inflicted by a *venomous* Animal, is ſaid to ſtick there, 'till it has drawn out all the *venom*, and then to fall off of it's own accord; they relate alſo that, if after it is fallen off, it be put into Milk, it will be purged, and recover it's virtue (*a*).

III. The

(*a*) Such *Specifics* have not been ſo far confirmed by experience, as to gain any *great credit* among the Phyſicians: whence we may conclude that theſe, excepting only the *cruſhing* of a *Scorpion* upon the Wound, are not only *uncertain* but even *frivolous*; wherefore it would be moſt injudicious and raſh, to truſt to theſe alone, while there are more approved and more efficacious remedies: as to the *application* of a *Toad*, or the *Fleſh* of a mad Dog to the wounds which they have inflicted, they are acknowledged by many of the moſt ſkilful Naturaliſts to be mere trifles and old Womens ſtories: nor does our moſt excellent AUTHOR himſelf propoſe this laſt *ſpecific drawer* for the cure of a *Hydrophoby* in his *Golden Aphoriſms*; but rather oppoſes and ſubverts with great juſtice all the *Specifics* that have hitherto been cried up for that diſeaſe (*Paragr.* 1147). But what ſhall we ſay of the *Serpent-ſtone*, the *virtue* of which, as related in the *text*, very many AUTHORS extoll with ſo great encomiums, and ſtrive to ſupport with ſo many experiments; among whom the chief are thoſe famous Philoſophers, the honourable Mr BOYLE, in his *Treatiſe of ſpecific Medicines*, and ATHANASIUS KIRCHER, in his *China illuſtrata?* This *queſtion* has been long ago anſwered by FRANCISCUS REDI in his *Epiſtle to* KIRCHER, *concerning natural experiments, pag.* 3. *&* *ſeq.* and by many experiments proved that the *virtues* of this *ſtone*, however boaſted, are quite *vain*. On the ſame account may be conſulted ENGELB. KÆMPFER, *Amœnitat Exotic. Faſc. III. Obſerv. X. ſect.* 2. If the Reader deſires to ſee more on this ſubject, he may conſult alſo DALE, *Pharmacolog. Supplement. page* 381, *&* *ſeq. Edit. Lond.* who has

III. The *third* Claſs contains thoſe which *prepare* the intermediate way; ſuch as, 1. Thoſe which *relax* the Veſſels. 2. Thoſe which render the Liquids penetrable. 3. Thoſe which by procuring ſuppuration, make the paſſage *open.*

CHAP. IX.

Of Repercutients or Repellers.

1. *REPERCUTIENTS are thoſe which repel the matter ſticking in any internal part of the Body, toward ſome other ſtill more internal.* The action of theſe is the ſame with the operation of *Drawers*, only that one is *from* and the other *to.*

2. Hence alſo there are three Claſſes of thoſe Medicines.

I. The *firſt* Claſs of *Repellers* does not differ from the *firſt* of *Drawers.*

II. The *ſecond* Claſs contains, inſtead of *Drawers*, which cannot conveniently be applied internally, various *evacuations*; ſuch as *purgations* by *Hydragogues*, *Bleeding*, *Salivation*: all which operate ſo far as they revulſe the matter from a place.

III. The *third* Claſs includes, 1. All that are *actually cold*; for the Fibres being conſtringed by *cold*, drive the matter toward the *more inward* parts;

has made a good collection of the *various Opinions* of Authors, concerning the *nature* and *virtues* of this ſtone; and has added beſides, "that a Boy of *three* years old, who had "taken ſome *Arſenic* in Milk, was freed from impending "*death*, merely by the repeated *application* of one of theſe "ſtones." But I cannot be perſuaded to believe it.

parts; thus therefore *cold* Water, *cold* Vinegar, *&c.* are here of ſervice; nay the more thick and the more compact a cold Body is, the better it operates. 2. All *ſtyptic*, *contracting*, and *conſtipating* Medicines externally applied.

CHAP. X.

Of Suppuraters and Ripeners.

1. *SUPPURATERS are thoſe which convert any part of a living Body into Pus*; I ſay of a *living Body*, becauſe no one has hitherto been able to convert the Solids or Liquids of a *Carcaſs* into *Pus*. Now *Pus* or *Matter*, is a thick ſubſtance, and though fat, yet capable of mixing with Water, of a whitiſh colour, and of no ſmell or taſte, provided it be *laudable*.

2. THERE is never any *ſuppuration*, unleſs the Veſſels are burſt, ſo that the Liquor flows out; for *Pus* was never obſerved to flow out of any burſten Veſſel, immediately on it's burſting; but that Liquid then flowing out, becomes *Pus* after ſome time, by ſtagnating; as appears even from hence, that if a Wound be continually abſterged, there will be no *Pus* found in it: therefore the *extravaſated* Liquid by ſtagnating is converted into *Pus* by means of heat; for the *moſt liquid* part then exhales, but the more *viſcous* remaining conſtitutes *Pus*: and this, ſo long as it continues *mild*, is a good *balſam*; but by *continuing* longer, it is turned by the ſame *heat* into a moſt thin *Liquid*,

yellow, grey, reddiſh, and at laſt black, acrid, eroding hurtful to the Nerves.

3. A SUPPURATING Medicine therefore is whatſoever burſts the Veſſels, and pours out the Liquid, and mixes it, being poured out, with the broken Solids, diſſipates what is moſt liquid, and at laſt moves and concocts the reſt.

4. *SUPPURATION* is required, where the impacted matter cannot be *reſolved*, and *reſorbed*, after it is extravaſated. It muſt be avoided therefore, where the *peccant* matter cannot be converted into *Pus*, as in a Schirrus, Cancer, Exoſtoſis: it ſhould be avoided alſo in places whence the *Pus* cannot be drawn out after it is formed, as in the internal parts.

5. ALL *Suppuraters* may be reduced to the *three* following Claſſes.

I. THE *firſt* Claſs contains thoſe which *diſſolve* the Veſſels by gently ſtimulating them, ſuch as, 1. *Gums* having aromatic and moveable parts; as *Gum Ammoniac*, *Bdellium*, *Galbanum*, *Myrrh*, *Elemi*, *Opopanax*, *Sagapenum*, *Tacamahacca*, *&c.* 2. *Roaſted Onions*, with *Flower* and *Oil.* 3. *Honey* mixed with other things. 4. Some Plants, as *Bay*, *Chamomile*, *Saffron*, *Melilot*, *Elder*, *&c.*

II. THE *ſecond* Claſs includes thoſe which join by the vital power the parts which before ſtagnated, and others which were ſeparated from each other; and this is done by means of *Drawers*, which determine the *moveable* parts of the Liquids to the *place* where the *Pus* ought to be made: hither therefore belong, 1. All *warm watery* Bodies, which *relax* the Veſſels; whence a greater motion ariſes to the above-mentioned *place.* 2. *Moiſteners* or *viſcous aqueous* Bodies: ſuch as *Pimpernal*, *Ducks-meat*, *water Lilly*, *Pellitory*, *&c.* all which contain *aqueous* and *glutinous* parts.

III. The *third* Claſs contains all thoſe which by *reſtraining* the Liquids being moved into a determinate *place*, hinder them from being too much *diſſipated* by the heat of the Body : hither therefore belong all that ſo ſhut up the *pores*, that the matter may be retained, be moved in the mean time, and yet not *exhaled:* and theſe are *Emplaſtics* ; as, 1. *Aromatic Gums*, with regard to their *glutinous* and *ſluggiſh* part ; but with regard to their *acrid* and *volatile* part, they act by ſtimulating. 2. *Honey* rendered tenacious by boiling. 3. All *meals* of *Beans*, *Peas*, *Chiches*, *Linſeed*, *Corn*, *&c.* 4. *Figs*, eſpecially if the more acrid part be expelled by a gentle Fire. 5. *Wax.* 6. *Yolks* of *Eggs.* 7. Freſh *Butter.* 8. *Fats* of all Animals. 9. Mild expreſſed *Oils.* 10. The *Herbs* called *emollient.*

COROLLARIES.

I. As there are *three* things neceſſarily concurring to *ſuppuration*, it appears from hence, how great the error of thoſe is, who always eſteem as *Suppuraters* ſome Medicines conſidered abſolutely and in themſelves ; whereas in reality they are not ſo, any farther than they are applied *jointly* with others.

II. Various forms of *Suppuraters* may be preſcribed, and ought to be ſo, as the matter to be *ſuppurated* is more or leſs *moveable*, or more or leſs deep under the *Skin*, as it is in a part more or leſs *glandulous.* Therefore if a great inflammation is to be *ſuppurated*, then omitting the Medicines of the *firſt* Claſs, thoſe only of the *ſecond* and *third* ought to be applied ; but if there is a *tough* matter, and the vital power is *weak*, then there is need of the Suppuraters of the *firſt* Claſs.

Now follow ſome forms of *Suppuraters*, for the *three* differing Claſſes.

(α) To *ſuppurate* a very *hot* inflammation,

℞. *Acetoſæ recent. M.* jv.
Butyr. recent. ℥ij.
Farin. ſecal. q. ſ.
F. Cataplaſma igne leniſſimo.

TAKE of freſh Sorrel *four handfulls, of* freſh Butter *two ounces, of* Rie meal *a ſufficient quantity. Make them in a Cataplaſm over a very gentle Fire.*

SORREL is a reſiſter of *Alkalines*, and *Rie meal* is the moſt ready thing to *grow acid* in heat; but in very *hot* inflammations, the Liquids always tend to an *alkaline* nature; and therefore this is the beſt form for peſtilential *Buboes:* and there is no larger a quantity of *Butter* added, becauſe a heavier plaſter is not to be applied, for fear of a Gangrene.

(β) In a *cold caſe*, or *cold tumour* with a *ſluggiſhneſs* of the *vital Power*, and inhering Liquid.

℞ *Flor. Chamæmeli,*
Sambuci,
Meliloti, ana ℥ij.
Croci ʒß.
Gummi Galbani (in vitello ovi ſoluti).
Olei Chamæmeli, ana ℥j.
Farin. Orobi q. ſ.
F. Cataplaſma.

TAKE of the Flowers of Chamomile, Elder *and* Melilot *of each two ounces, of* Saffron *half a dram, of* Galbanum *diſſolved in the yolk of an Egg, and* Oil of Chamomile, *of each an ounce, of the*

the meal of Orobus *a ſufficient quantity, make them into a Cataplaſm.*

THIS method of diſſolving *Gums* is very good in caſes where there is need of *opening*. But the following is the beſt form where there is danger of a *Schirrhus*.

(γ) To convert Schirrhous Glands into *Pus*.

℞. *Mellis ad tenacitatem coƈti,*
Ficuum recent. contuſ. ana ℥ij.
Ceparum ſub ciner. aſſat. ℥jv.
Ol. Lilior. Alb. q. ſ.
F. Cataplaſma.

TAKE of Honey boiled to a tenacity, *and* freſh Figs contuſed, *of each two ounces, of* Onions roaſted under the embers *four ounces, of* Oil of white Lillies *a ſufficient quantity. Make them into a Cataplaſm.*

THIS form elegantly promotes *ſuppuration* without a great inflammation: but if there is a *viſcid tumour*, as in a venereal Bubo, then there is need of another form.

6. *RIPENERS are thoſe which ſo diſſolve what are to be ſuppurated, that the whole matter gathers into one place, without any diviſion or ſeparation made by cells, to that end, that an outlet being made, the whole ſuppurated matter may be at once expelled.* Now as what are to be *ſuppurated* are nothing but half broken Solids, and ſtagnating Liquids, a *Ripener* is nothing but a *Suppurater* a long time applied in ſuch a manner, that all may be *reſolved* by it.

7. But we know this *maturation* or *ripening* to be made by the very great *ſoftneſs* and *fluctuation* of the part. But the longer the matter to be *ſuppurated* remains cloſe, the eaſier it is *concocted*: and indeed the greateſt care is to be taken, that all the indurated parts become *ſoft* quite round, before the Skin is opened: for when once that is done, what was not *ſuppurated* before can hardly be brought to *Suppuration.*

The Fourth CLASS

Of Topical MEDICINES.

THEOREMS.

Of TOPICS in general.

I. A *TOPIC is a local Medicine, which heals any part of the Body by ſome action or force that is peculiar and appropriated to that part.*

II. A *Topic* therefore ought to have ſuch an action or force, as may *ſpecifically* amend the Solids and Liquids of that part to which it is appropriated.

III. But it performs this, either becauſe it tends to that part by it's own *bulk*; or becauſe it ſo *prepares* what are going thither, that when they are carried to this place, they act *topically*. Hence alſo a *Topic* is *twofold*; either becauſe it is applied to the part by it's own *bulk* and *ſubſtance*, and *acts* there; or becauſe it *prepares* other things which are ſent to the part. Thus for example, a *Cephalic* is ſaid to be that, which being received into the Stomach, and carried to the Head, *operates* upon it; or which ſo *prepares* and *diſpoſes* the Blood, otherwiſe unfit for it, that it may relieve and heal the Head.

IV. Whatsoever goes to any part, either tends thither by the law of univerſal circulation, or is determined *thither* by ſome other *force.*

V. By the law of univerſal circulation, there cannot be any *Topic*, unleſs there are ſome *mechanical* conditions in it, that it may go by the univerſal motion, to *one* place rather than to another. For example, if one globule of *Mercury* and another of *Wax* were projected together out of the Heart, theſe globules are of that nature, that the *former* would be carried towards the upper, and the *latter* towards the lower parts: for the globule of *Mercury*, being very heavy and ſolid, will preſerve it's motion in a *right line*; and therefore will be carried to the Head: in the mean time the globule of *Wax*, being very light, will ſoon loſe it's motion upwards and in a *right line*, and be thruſt to the lower parts. The truth of this aſſertion may be evinced by the doctrine of the *projection of Liquids through Pipes:* it is manifeſt therefore, that there may be ſuch Medicines; ſee Boyle *of Hydroſtatical Medicines.*

VI. The determination to a *place* is obtained by *drawing* Medicines, of which I treated above.

VII. All that are called *ſpecific Topics*, which operate, as was ſaid before, either by being *applied* to the part, or by *preparing* what are going thither, act either by relaxing, or ſtimulating, or contracting, or condenſing, or moving, or attenuating, *&c.* according to the doctrine already laid down concerning the *operation of Medicines.*

VIII. Hence therefore it plainly appears, that the *power* of *Topics* conſiſts in a *determination* to a certain *place.*

IX. And therefore the whole doctrine of *Topics* conſiſts in a deſcription of the *determining* cauſes.

X. All *Topics* are uſually divided, according to their effect, into *hot* and *cold.*

Now theſe Theorems concerning *Topics in general* having been premiſed, it remains, that we treat of them in particular.

CHAP. I.

Of CEPHALICS.

1. *CEPHALICS are thoſe which peculiarly regard the Brain, and not the other parts of the Body.* Now the functions of the Brain are two; (α) to *ſecrete* the Animal Spirits, and (β) to *diſtribute* them afterwards: but that theſe functions may rightly proceed, there is required an *adaptation* of the Veſſels, and a *due* ſolution of the Liquids; hence therefore whatſoever *adapts* the Veſſels, and duly diſſolves the Liquids, is a *Cephalic.*

2. *CEPHALICS* are of *two* ſorts; namely, 1. *Hot*, which abound with a thin Oil, Salt, and Spirit: all Attenuants therefore belong hither, eſpecially thoſe which at the ſame time have a *pleaſant* ſmell and taſte; as *Southernwood*, *Betony*, *Germander*, *Calamint*, *Lavender*, *Marjoram*, *Balm*, *Mint*, *Origany*, *Roſemary*, *Sage*, *&c.* Hither alſo belong ſome *Inſects*, as *Wood-lice*; alſo *Spirit of Caſtor*; alſo *Sal volatile oleoſus*, aromatic Oils, *&c.* 2. *Cold*, namely thoſe which affect the Noſe with a *grateful* ſmell without *heat*; as *common Lilies*, *Lilies of the valley*, *Roſes*, *Violets*, *&c.*

CHAP. II.

Of Ophthalmics, Odontalgics, Otalgics and Stomatics.

1. THE function of the Eye is to *ſee*; and whatſoever hinders this is ſaid to be a *diſeaſe* of the Eye: ſuch as the faults of the *Eye-lids* ariſing from a palſy or tumour, which by the way do not differ from *diſeaſes* of the ſame name in other parts, hurts or inflammations of the *Cornea*; or horny coat of the Eye, it's *Phlyctenæ*, Hydatids, unnatural colour, opacity, exulceration, *cicatrix*, any Body growing to it internally: all which indeed are to be conſidered after no other manner than as if they *infeſted* any other part. Moreover that Eye does not *ſee*, which has any *diſeaſe* in it's humours, as a *Suffuſion*, or a *Cataract*, &c. or becauſe of the *faults* of the optic Nerve; or when the Lymphatics *ſwell*, which are largely diſperſed through the Retina, as RIDLEY has demonſtrated in his *Anatomy of the Brain:* but in theſe laſt caſes, as nothing can be applied *externally*, the principal remedy is *Mercury* properly applied, to excite a *ſalivation*; but not that it acts *ſpecifically* on the Eye, but by an *univerſal operation* on the whole Body. The Eye alſo *offends* by immobility; for it *offends*, if the reſorbent Veſſels cannot reduce the *aqueous humour* the ſame.

BUT in all theſe the titles of *Specifics* are to be omitted; but it is to be inquired, what *fault* there is in the Solids and Fluids; and the *cure* ought to be inſtituted from general indications: but this ſeems chiefly to be inculcated, becauſe even the beſt Phyſicians cannot yet leave off the titles of *Specifics*, but always think that ſomething is to be *ſpecifically* required; whereas there is indeed no difference properly, for example, whether an *inflammation* is in the Eye, or in the Hand.

HENCE therefore *thoſe are ſaid to be Ophthalmics, which remove ſanguineous, ſerous or lymphatic, and nervous Inflammations.* For it is the ſame in all.

2. *ODONTALGICS are thoſe, which take away arterial ſanguineous inflammations, and ſuch as are in the Lymphatic Veſſels, or in the Nerves; and by this means aſſwage the pain of the Teeth.* Hence alſo *relaxing Purges* ſometimes become *Odontalgics*; as do *Opiates* alſo.

3. *OTALGICS are thoſe which aſſuage the pains of the Ears.* And theſe again include all ſuch as remove the inflammations of the *three* ſorts mentioned above.

4. *THOSE are called Stomatics, which cure the diſeaſes of the Mouth.* And theſe are common to the Mouth and other parts; and therefore Medicines have nothing that is *ſpecific* for thoſe *Diſeaſes.*

CHAP. III.

Of ARTERIACS.

1. THE Ancients gave the name of *Artery* to the *Larynx*, or properly to thoſe harder Canals, which enter the Lungs (*a*), and are called

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(*a*) Conſult GALEN, *Libr.* 6. *de* HIPPOCR. *and* PLAT. *Decr. cap.* 9.

called by the Moderns the *Aſpera Arteria*; and they called *thoſe Arteriacks, which remove the diſeaſes of the Larynx and the Bronchia* (b), *and particularly their roughneſs*: which is frequent in a *Cough*; and ariſes from a *penury* or *defect* of the Liquid which is there ſecreted; whence it comes to paſs that the nervous filaments remain *naked* and *dry*.

2. *ARTERIACKS* therefore are thoſe Medicines, which ſupply a like Liquid: as, 1. All the *mild Oils*, ſlowly ſwallowed. 2. All that can be received with the Air into the Lungs in the form of a *mild vapour*, as *farinaceous* and *emollient decoctions*: here alſo Emulſions, Linctuſes, Syrups, and inſpiſſated juices are of ſervice; but eſpecially ſuch as are prepared from *ſweet Almonds*, *ſeeds of white Poppy*, *four greater and leſs Cold-ſeeds*, *Coco Nuts*, *Walnuts*, *Filberts very freſh*, *and Piſtachios*; from which an Oil is drawn either by emulſion, or by expreſſion. 3. The chief of all *Arteriacks* is *Opium*; which by taking away the ſenſe of *Titillation*, aſſuages the *Cough*; which being taken away, the *Liquors* ſecreted in the *Trachea* and *Bronchia*, tarry there, and by lubricating them remove the *Acrimony*. Arteriacks therefore are all thoſe which reſtrain a *Cough*.

(b) *Idem Libr.* 7. *de Compoſ. Medicam. ſec. Loc. cap.* 1. See alſo CASP. HOFMANN, *Inſtit. Med. Libr.* 2. *cap.* 13, *ſect.* 2.

CHAP. V.

Of THORACICS.

1. THE function of the Lungs is *twofold*; *Reſpiration*, and the *propulſion* of the Blood into the left Ventricle of the Heart. Whatſoever

ſoever therefore promote theſe *two* functions, uſe to be called *Thoracics*: but in truth there are ſcarce any *ſpecific Thoracics* properly ſo called; for thoſe which are called by this name, *act* quite in the ſame manner as other Medicines, by attenuating, inſpiſſating, ſtimulating, *&c.* for thus *Hyſſop*, *Marjoram*, *Penny-royal*, *Scordium*, *Sulphur*, *&c.* which are called *Thoracics*, uſe to operate by attenuating; and they are then to be accounted *Thoracics*, when the venal Blood is ſo *viſcid*, that it can ſcarce flow through the Lungs: thus alſo *Pulmonaria* is the beſt *Pulmonic* remedy, when a too *hot* and *quick* Blood wants to be ſweetened and inſpiſſated.

2. But if any thing is to be accounted a *true Thoracic*, it is the *Air* it's ſelf, ſo far as being impregnated with ſome *vapours* it is received into the Lungs: and therefore, 1. When too *thin* and *acrid* a Lymph glides from the too much relaxed lymphatic Veſſels into the Lungs, then *Fumigations* of *Maſtic*, *Franckinſenſe*, *Benjamin*, are the beſt Pulmonics. 2. If there is any *alkaline* and heating acrimonious *exhalation*, as in the Plague, Small-Pox, malignant Fevers, then the *vapour* of *Rheniſh Vinegar*, or *Gun-powder* is a true *Pulmonic*. 3. Where the *effluvia* of *Spirit of Vitriol* or *Aqua Fortis* invade the Lungs, whence oftentimes grievous Peripneumonies and Aſthmas ariſe, the beſt *Pulmonic* is the *vapour* of *putrefied Urine* received directly into the Mouth; from which *vapour* the very *Acid* infeſting the Lungs is converted into an innocent *volatile Salt*. 4. If the *thick* and *acrid* matter occupies the Lungs, and ſtuffs up their paſſage, the beſt *Pulmonic* is a *vapour* of *warm Water*, with a mixture of a little Salt of Tartar and Urine, alſo of relaxing and ſtimulating Herbs. 5. When there is too great a *dryneſs*, and *tough thickneſs*, then it is to be diluted by a *vapour* of *warm Water*;

by applying a *ſponge* moiſtened with the ſame *Water* to the Noſe of the *Patient*, and directing him at the ſame time, to *inſpire* through the Noſe, and *exſpire* through the Mouth.

CHAP. V.

Of Cardiacs or Cordials.

1. THE hiſtory of *Cordials* is very difficult; becauſe what is a *Cordial* to one is a *Poiſon* to another. Now we call that a *Cordial* which *increaſes* the *powers* of the Body rather than of the Heart; the *force* of the Heart may be *increaſed* to the detriment of the *Health*; for in an inflammatory Fever, if the *force* of the Heart be increaſed, a *weakneſs* of the Body will follow, which may be ſucceeded by *death* itſelf.

2. By *forces* I mean the *corporeal powers* which move the Muſcles and Liquids: hence the *forces* or *powers* are *twofold*; namely, either *animal* or *natural*. Therefore *a Cordial is properly whatſoever increaſes the animal power of moving the Muſcles, and the natural power of moving the Liquids.*

3. The *animal power* of moving the Muſcles entirely depends on the *due ſecretion* of the animal Spirits in the Brain; and *this* on the *due motion* of the Liquids through the Veſſels. But to *this motion* is required, 1. That the *contractile force* of the Heart drive the Liquid in ſuch a manner, that there may be a ſufficient *quantity* in every part of the Body. 2. That the Veſſels may be *fit* to tranſmit the Liquid. 3. That the Liquids may be *moveable*, or fit to *flow*.

4. HENCE alſo we may reduce *Cordials* to the *three* following Claſſes.

I. THE *firſt* Claſs contains thoſe which *act* on the animal Spirits. 1. By affording a ſubſtance *fit* to produce them: and this ſubſtance approaches the neareſt to the *white of an egg*; conſult HARVEY, *Tract. de Generatione Animalium*, where he treats *of the white of the egg*, and of the *nouriſhment of the chicken in the egg*; alſo MALPIGHIUS *Tract. de Ovo incubato*; alſo *de formatione Pulli in Ovo.* Thoſe are obſerved to be the *moſt robuſt*, whoſe *Serum* comes neareſt to the *white of an egg*; whence it appears, that the origine of the animal Spirits is from *aliments*, ſo *changed*, as to approach the neareſt to the *white of an egg*, but ſo *attenuated* by circulation, as to concrete by the Fire. Moreover, the greateſt ſubſtance of the Spirits is afforded by *light* and *nouriſhing* meats and drinks, of a taſte and ſmell agreeable even to Infants: ſuch as *milk*, ſmall *broths* of ſound Animals, well ſcented *wines*, well fermented *malt liquors*, ripe, pleaſant and fragrant *ſeaſonable fruits*; as *Grapes*, *Currants*, *Cherries*, eſpecially the black, *Mulberries*, *Apples*, *Melons*, *Peaches*, *Oranges*, &c. 2. By determining to the *Cerebrum* or *Cerebellum* the Spirits that wander to this or that Muſcle: ſuch are all *Antiſpaſmodics*, and removers of hyſterical and hypochondriacal ſuffocations; all which *operate* indeed either by ſtimulating, drawing or relaxing. 3. By *raiſing* the quieſcent Spirits: ſuch as all that have a *pleaſant* taſte and ſmell; as any *Aromatics*, eſpecially the *oriental Balſams*; as *Cinamon*, *Nutmeg* and *Mace*, *Cloves*, *Zedoary*, *Galangal*, *&c.* alſo *Orange peel*, *China Citrons*, *the grateful ſmell of Pomegranates*, *Southernwood*, *Balm*, *Thyme*, *Lavender*, *Roſes*, *Jaſmin*, *Lilly of the Vallies*, *Kermes berries*, *Saffron*, *&c.* Hither alſo belongs *Opium* (*a*); hither alſo belong all *generous Wines*, *Spirits of Wines*, *oily Spirits*, *aromatic*, *oily*, *alkaline*, *volatile Salts*, and all *compoſitions made of them*; all *eſſential and aromatic Oils*, *Tinctures*, *Elæoſaccbara*, *Syrups*, and *Confections* of this ſort.

II. The *ſecond* Claſs contains thoſe which *act* on the Veſſels, by rendring them fit for the tranſmiſſion of Liquids: and theſe are, 1. Thoſe which *relax* the too tight Veſſels, ſuch as *Baths*, which in this ſenſe deſerve the name of *Cordials*. 2. Thoſe which *ſtrengthen* the two lax Veſſels, and reſtore their loſt *elaſtic force*: therefore the *Peruvian Bark*, *Quinces*, *Steel*, *rough Wine*, *&c.* perform the office of *Cordials* in thoſe whoſe Veſſels are *ſluggiſh* and *flaccid*; but are *deſtructive* to thoſe who have *tight* Veſſels: thus therefore *Steel* is of the greateſt ſervice in the moſt *lax* diſorders of Virgins: but in acute diſeaſes, where the Veſſels are *conſtringed*, it cauſes incurable *Schirruſes*, or death.

III. The *third* Claſs includes thoſe which *operate* upon the circulating Liquids; and theſe either by *diluting* or *incraſſating* them, according as they are too *thick* or too *thin*, but if the Liquids want *diluting*, there is ſcarce any better *Cordial* than *Water* moderately *warm*.

(*a*) That is, ſo far as it *rouſes* the quieſcent Animal Spirits, by attenuating the Blood, if it is rightly adminiſtred. But concerning this *attenuating power* of *Opium*, the arguments and experiments of the famous Dr Freind, in his *Emmenologia cap. ult.* highly deſerve to be conſulted.

CHAP. VI.

Of CARMINATIVES.

1. C*ARMINARE* ſignifies to aſſuage with *verſes* (*carminibus*): for the Ancients thought that Poets by means of their verſes could aſſuage *pains* and too vehement *motions*; hence APOLLO was accounted equally the inventor of *Poetry* and *Phyſic*.

2. *NOW a Carminative is properly that which moves Flatuſes, together with the pains of the Inteſtines:* wherefore he that would explain the power of a *Carminative* Medicine muſt inquire, how *Pain* and *Flatuſes* may meet together in the Inteſtines, and whence they are generated.

3. *PAIN* in general ariſes from too great a *diſtraction* of a ſenſible Fibre; (ſee more in the CHAPTER *of Solvents or Cauſers of Pain.*) Now a *Flatus* ſuppoſes an *elaſtic* liquid matter, rarefied by heat, and retained in the Inteſtines by ſome *force*, to ſtop there, and that at laſt it overcomes this *force*, and burſts out with great violence.

4. THIS liquid *elaſtic* matter is the Air it's ſelf, which indeed burſts either *upwards* or *downwards*; and ruſhes through the Inteſtines, now one way, and now another; whence come *Borborygmi:* and therefore there are *three* ſorts of *Flatuſes* in diſeaſes; which are called *Ructus*, *Crepitus* and *Borborygmi*.

5. NOW this *elaſtic* matter, namely the *Air*, enters the Body by the Gullet, and paſſes through the Inteſtines, whence it makes it's exit through the *Anus*, without producing *Pain* and *Flatuſes*, unleſs it be pent up and rarefied by heat; but if it is pent up, then it creates horrid ſymptoms: moreover it

is pent up either by an *external force* preſſing it, as is often obſerved in Women, who preſs the *Abdomen* by lacing too tight, or by the *contraction* of the Fibres, as it happens in *Spaſms* of the inteſtinal Fibres, or firſt paſſages; thus the *Sphincter* of the *Oeſophagus* or Gullet is often *ſpaſmodically* contracted, as in hyſterical Perſons; hence the *Air* is there included, and being rarefied vehemently extends the Gullet; whence the Wind-pipe is then compreſſed, and thus there ariſes a fear of *ſuffocation*; nay indeed hyſterical Women are ſometimes for a little while really *ſuffocated*: and hence it is eaſily enough explained, whence the *ſwelling* in their Abdomen proceeds. A *conſtriction* of this kind ſometimes happens about each *orifice* of the ventricle, whence the Stomach is greatly diſtended: much the ſame alſo happens, if any *Spaſm* occupies *ſucceſſively* ſometimes one, ſometimes another part of the Gullet; and thence a moſt perfect ſenſe of a *globule* riſing up to the Throat is excited: the ſame alſo happens, if a part of the inteſtinal Tube is at any time *conſtringed*. All which *pains* are relieved by the expulſion of the *Flatus*.

6. *CARMINATIVES* therefore are thoſe, which take away ſuch *Spaſms*; whence *relaxing* and *opening* Medicines are *Carminatives*. Hence therefore *Water* drank moderately *warm*, alſo *warm Oils*, *oily volatile Spirits*, all *Antiſpadomics*, *external Motions*, *Baths* and *Fomentations* belong to this place; but the chief of all is *Opium*.

7. THE *cauſes* of the before mentioned *Spaſms* in the firſt paſſages are, 1. Some *diſeaſes* which determine the nervous Liquid more towards *one* part than towards *another*. 2. *Poiſons* or *Acrids taken in*, which frequently excite *Gripings*, *Flatuſes* and moſt violent *Tumours*, and thoſe often ſo great, as even to *burſt* the Inteſtines: for if the *cauſtic*

power applies it's ſelf to any part of the inteſtinal Tube, it will *contract* and *conſtringe* it's ſelf; whence the *elaſtic* Liquid will be ſhut up, be rarefied by heat, and excite *pains*, the Spirits in the mean time ruſhing in great plenty to the part in *pain*, as is uſual in all ſorts of *pain*; whence a more violent *contraction* will ariſe. In this caſe therefore *Carminatives* are thoſe which either extinguiſh *Poiſon*, or diminiſh the *preſſure* and *flux* of the nervous Liquid towards the part affected, as *Opium*, and all *Opiates*; which at that time *operate* almoſt in the ſame manner as *bleeding* in an inflammation, namely by diminiſhing the *impetus*.

8. *WARM CARMINATIVES* act ſo far as they ſtimulate and excite a *motion* through the whole tract of the Inteſtines; whence the *contraction* and interception of the *Air* are taken away.

CHAP. VII.

Of ANTHELMINTHICS.

1. *HELMINTHES* is the GREEK name for *Worms*; hence *thoſe Medicines are called Anthelminthics, which kill and expell Worms.*

2. THE places in which *Worms* neſtle and creep are the Stomach and all the Inteſtines; but they are ſeldom in the Colon, except while they paſs through this Inteſtine: now that theſe are the places where *Worms* conceal themſelves, is manifeſt from the *Titillation* which they excite in the Sto-

mach and Inteſtines, and the *diſcharge* of them by *vomiting* and *ſtools (a).*

3. *ANTHEL-*

(*a*) *Worms* are Animalcules of different kinds, *generated* in the human Body from the *Eggs* of Inſects: for as various kinds of Flies and Inſects, after a ſucceſsful copulation, lay their *ſpermatic Eggs* more or leſs copiouſly on ſeveral *eſculent* Bodies, as on Herbs, Fruits, Flowers, or other things that are fit for *food* or *drink*, and as theſe things afterwards, being defiled with this *ſpermatic-verminous* filth, are either immediately eaten by Men, or are devoured by Brutes that afford food to Men, and at that time ſuch *Eggs* are tranſmitted into the Bodies of Men: add to this, that even the *Air*, which we breathe and ſwallow, is ſufficiently known by the experiments of modern Philoſophers to *abound* with the *Eggs* of Inſects; whence it comes to paſs, that ſuch *Eggs* being ſwallowed with *meats* and *drinks*, and even together with the *Air*, nay and ſometimes perhaps with other *Worms* alſo, which are contained in the before mentioned things, being taken into our Body, and there being enlivened by the *mild cheriſhing* and *heat* of the Stomach, Inteſtines, or other parts, are converted into creeping Animalcules, as happens alſo on the outſide of our Body and that more and more frequently in the tender *Stomachs* and *Bowels* of Children, than in the ſtronger ones of grown Perſons. Hence ſuch *Worms* are obſerved to be *generated* in different parts of the human Body: for they are found not only in the Stomach and Inteſtines, but alſo in the Liver, Kidneys, Bladder, Lungs, *Pericardium*, Brain, hollow Teeth, *&c.* nay and the celebrated RUYSCH has not long ago diſcovered the *Exuviæ* of *Chryſalides* or *Nymphæ* in the inner *cavities* of the Bones. (See his *Adverſar. Anatom. Dec. III page* 18. *& ſeq.*) The ſame famous AUTHOR alſo ſays in another place, *Adverſar. Anat. Dec. I. page* 18) that it is to be obſerved, “ that *Worms* are generated in the human “ Body of ſuch different forms from each other, and yet “ ſo differing from every thing elſe in nature, that nothing “ *like* them is ever to be ſeen without the human Body; and “ ſome of them are extended to ſeveral *ells* in *length*. And “ he thinks it very probable, that they do not owe their origine “ to *litle Eggs* ſwallowed down, but rather that they are “ produced in our Body from *Eggs* generated in us at the “ ſame time with the other parts of our Body.” Now this agrees with the *opinion* of HIPPOCRATES, and of a many other great Philoſophers, and eſpecially of that moſt experienced Phyſician of *Paris*, NICHOLAS ANDRY; who has written an excellent treatiſe in the *French* tongue, on the *Worms that*

are

3. *ANTHELMINTHIC* Medicines may be reduced to the *two* following Claſſes.

are generated in the human Body. But after what manner ſoever *Worms* may grow in us, thoſe, of which we are at preſent ſpeaking, are the moſt frequently obſerved; which moſt often lie hid in the Stomach, and ſometimes in the Inteſtines. Now there are *three ſorts* of them commonly diſtinguiſhed by Phyſicians; 1. The *round Worms*, in *Greek* Ἕλμινθες στρογγύλαι. 2. The *broad Worms*, in *Greek* πλατεῖαι, ſometimes κειρίαι and ταινίαι, that is *Faſciæ*, whence they are alſo called *Faſciati*, or *Tape Worms*, becauſe they reſemble a piece of *tape* or ribband except their head and tail, which end in a ſharp point. 3. The *Aſcarides*, which name is given them only by GALEN, in his *Exegeſis*. The *Round Worms* are the moſt common, and the beſt known of all, and are uſually generated in the *ſmall* Guts, in great plenty; whence they often riſe up into the Stomach, and ſometimes are caſt out by the Mouth, and ſometimes by the Noſe, though moſt often they are driven out by the *lower paſſages*, ſometimes *alive* and ſometimes *dead*: theſe are very common in Infants. But it is not eaſy to know when Children are afflicted with theſe Animalcules; becauſe moſt of the *ſigns* and *ſymptoms*, which are produced by them, are *common* with thoſe of other diſeaſes. But however, *bitings*, *gnawings*, and *ſudden* and *intermitting gripings of the Belly*, eſpecially on an *empty Stomach*, *leanneſs*, *paleneſs of the Face*, *hollowneſs about the Eyes*, *reſtleſſneſs in the night*, and *grievous watchings*, *frequent rubbing of the Noſe*, *ſtinking Breath*, *dry Cough*, ſometimes attended with a *difficulty of breathing*, *ſometimes* alſo a *ſlow Fever attended with thirſt*, *ſhiverings*, *head achs*, *heart burns*, ſometimes *faintings*, *a ſwelling and tightneſs of the Abdomen*, *Hickups*, *Nauſeas*, *Vomitings*, *frequent putting the hands to the Belly*, *ceaſing of gripes after eating*, *too great voraciouſneſs*, *ſtools of a grey colour*, *reſembling a ſolution of clay*, in the laſt place, *crude and turbid Urine*, *almoſt like Milk*, are the uſual ſigns of theſe *Worms*: though all the ſymptoms are ſometimes greatly varied; for there is no *ſymptom* ſo ſtrange, as may not ſometimes ariſe from *Worms*, as we find by the obſervations of Practitioners. Now if we regard the *Prognoſtic*, *Worms* may dwell a long time in the human Body without any notable hurt or trouble; but yet it often happens, that moſt cruel *ſymptoms* are produced; ſuch as a *Fames canina*, *ſleepineſs*, *delirium*, *continual*, *ſlow* and *hecticFevers*, nay and often thoſe which are called *malignant*, together with *mortal convulſive* and *epileptic fits*; ſometimes

I. The firſt Claſs contains thoſe, which are known by experience to *kill Worms:* ſuch as, 1. All *Oils,*

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the Inteſtines or Stomach are *eaten through* by *Worms,* and thence *death* enſues: in a word, the moſt grievous *ſymptoms* may hence ariſe. The *Tape Worms* are the moſt rare: but they have one *peculiar ſymptom,* among others which they have in *common* with the reſt, namely, the diſcharging, together with the excrements, *little Bodies* reſembling the *ſeeds* of *Gourds*; and theſe ſeem to be the *excrements* of the *Tape Worms*: the length of theſe Worms often amounts to ſeveral ells; and they are not numerous, but generally only one, which is therefore called *Solium,* and ſometimes two meet together. If any one deſires to know more of theſe *Worms,* let him conſult the Authors who have treated expreſsly on this ſubject, and eſpecially Dan Le Clerc, *Hiſtor. Latorum Lumbricorum.* In the laſt place, thoſe *ſhort* and *Minute Worms,* which are called *Aſcarides,* are uſually generated and gathered together in great numbers and heaps in the *Inteſtinum Rectum,* and are in ſize, thickneſs, and ſhape like *needles*: theſe are protruded alive from the *Anus,* together with the excrements; they are very common in Infants and Children, and are ſometimes found in grown Perſons, the *Pathognomonic ſign* of *Aſcarides* is an *almoſt intolerable itching in the Fundament, with a frequent and troubleſome Teneſmus, or needing to go to ſtool*; nay and ſometimes theſe little torturers cauſe ſuch vehement torments in the Perſons affected, as to make them *faint* away; but though they do not uſe to create ſuch *grievous ſymptoms* as the others, yet concerning the *method* of *killing* and *expelling* theſe *Worms,* the Reader may conſult Fuller's *Pharmacop. Extempor tit. de Enem Amar. p. m.* 110. Thus much may ſuffice concerning *Worms*: he that deſires to know more may conſult beſides Nicholas Andry and Dan. Le Clerc, in the *Treatiſes* mentioned above, the various Authors which have treated at large on this argument, namely (α) The *Writers of natural hiſtory*; and in the firſt place, Ulysses Aldrovandus, *Libr* 6 *de Inſectis, cap.* 2. Franc. Redi, *Obſervat. de Animalculis vivis quæ in corporibus vivorum Animalium reperiuntur, &c.* alſo (β) the *Collectors* of *Medical Hiſtories and Obſervations*; eſpecially Schenckius, Bartholin, Stalp Van der Weil, Paullinus, *Diſquiſit de Morte Verminoſa,* though here he heaps a great many foreign and uſeleſs things according to his uſual manner; alſo Hildanus, Forestus, Tulpius, *&c.* (γ) Laſtly let the beſt practical Phyſicians be conſulted concerning the *knowledge* and *cure* of *diſeaſes* ariſing from *Worms.*

Oils immediately applied to *Worms* ; which indeed deſtroy them in a ſhort time by obſtructing their *Tracheæ* : therefore let *Oil* be drank, or thrown up in form of a Clyſter ; for thus the AUTHOR cured one who was troubled with the *Aſcarides*, after all other remedies had been tried in vain, only by a clyſter of *Oil* retained a long time, after having firſt gently *purged* the Belly. 2. All preparations of *Honey* ; which act after the ſame manner : thus therefore after the taking of a gentle *purgative*, on an empty Stomach, that there may be no obſtruction, *Honey* being *drank* is an excellent *Anthelminthic*, eſpecially for Children. 3. Thoſe which *kill* the *Worms* by wounding, bruiſing, and pricking them : as the little *bones* of *Fiſhes*, *Hart's horn*, filings of Steel, and ſuch like, which act after the manner of *darts* ; but theſe ſeldom leave the *tender* Inteſtines untouched. 4. *Poiſons* appropriated to theſe Inſects : as *Mercury*, ſo prepared as only to paſs through the Inteſtines, and not to penetrate into the Lacteal Veſſels (*b*), ſuch a preparation is the *Æthiops Mineral* in powder, given with a gentle Purgative : alſo the *Vitriols of Metals*, as of *Steel*, *Copper*, *Silver*, if they are taken in Pills, and determined downwards, by the addition of a gentle *Purgative*.

II. THE *ſecond* Claſs contains thoſe which *expel* the *Worms* : ſuch are all *Purges* and *Vomitories*, of whatſoever kind, without any diſtinction, provided they be taken on an empty Stomach. But thoſe *bitters*, which are uſually commended as *Anthelminthics*,

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[(*b*) There is not perhaps any *preparation* of *Mercury* more proper for this purpoſe than the *crude Quickſilver* it's ſelf, taken every morning faſting, from ℥ſs to ℥ij for a conſiderable time. But care is to be taken, not to catch cold which I have known in ſome inſtances, though very rarely, to cauſe a ſlight ſalivation.]

minthics, and honoured with that name, *do good* only by *accident*; namely when the inteſtinal Fibres are too *weak* to expel the *neſts* of *Worms*; but theſe *bitters*, do not *kill* the *Worms*. It is to be obſerved alſo, that thoſe are in a great error, who ſay, that a Man cannot be freed from *Worms*, unleſs they are expelled by the *Anus*, at the ſame time that they are *killed*; whereas they are of ſo tender a texture, that if they are once *killed*, they ſoon *rot*, and come out in the form of a *mucus*.

CHAP. VIII.

Of ANODYNES.

I. *ANODYNES are thoſe Medicines, which take away pain in general.* And under this Head are contained, 1. *Paregorics*, which take away pain by *aſſuaging* it; 2. *Hypnotics*; which take away pain by cauſing *ſleep*. 3. *Narcotics*; which take away pain by cauſing a *ſtupidity*. 4. *Nepenthes*; which properly ſignifies *a Medicine that takes away pain* (*a*).

But

(*a*) In this ſenſe therefore *Nepenthes* is ſynonymous with *Anodyne*; and does not ſeem proper to conſtitute a *peculiar* Claſs. Beſides, there has been no ſmall diſpute among Authors what that *Nepenthes* really was, which Homer has ſo highly extolled in the *fourth Book* of the *Odyſſes*; it would be to little purpoſe to recite all their various *opinions* in this place: it may ſuffice for the preſent, to ſay only a little upon this argument. The word Νηπενθὲς is compoſed of the *privative particle* νη, and πένθος *mourning*; becauſe this Medicine diſpells *ſadneſs* and brings *joy*; for, according to Homer, it was mixed with the *Wine* by Helen, to make the Gueſts of Menelaus chearful;

BUT as *Anodyne* is a general name comprehending the *four ſpecies* of Medicines, which were ſaid before to take away pain, I ſhall firſt premiſe ſome THEOREMS concerning *pain in general.*

I. NOT only the *fluid* but alſo the *ſolid* parts of our Body are ſubject to *pain*; and thoſe ſo far as they are compoſed of Nerves, and no otherwiſe: now ſome Nerves are *open* and *hollow*, and others are *conſolidated*; and the Nerves of the firſt kind only are affected with pain.

II. IN every Nerve being yet *alive* if it's *laſt component* part be conſidered, there occurs only a *very fine* Membrane, and at the ſame time a Liquid detained and confined in it: now every *laſt* nervous Membrane, of any Nerve whatſoever,

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chearful; and ſhe had received this drug as a preſent from POLYDAMNA an *Egyptian*, the Wife of THONE: the POET affirms that the *Nepenthes* is endued with ſuch a *power*, that whoſoever ſwallows it, entirely *forgets* all *evils*, and would not weep all that day, though his Father and Mother ſhould die, or his Son and Brother be killed before his face. Whence we may conjecture, that by this ſo celebrated *Nepenthes* of HOMER is meant *Opium* it's ſelf, or ſome *Compoſition* of it; ſeeing it grows chiefly in *Egypt*, where it was preſented to HELEN; and has a *faculty* alſo of *exhilarating* thoſe who are uſed to it, and of diſpelling *fear* from their minds, as is abundantly manifeſt from the example of the TURKS and other oriental People. Hence alſo the CHYMISTS ſeem to have transferred that word to a certain *Compoſition* of *Opium*, which is called *Nepenthes Aureum* ANGELI SALÆ, and is deſcribed by this AUTHOR in his *Opiolog. page m.* 610; and therefore alſo the common *Laudanum Opiatum* is called *Nepenthes* in the *preſcriptions* of ſome Phyſicians. But if any one would know more concerning this word, and it's ſignifications, let him conſult in the firſt place the *diſſertation*, which CONRAD. BARCHUSEN has made entirely upon this argument, and annexed to his *Hiſtoria Medicinæ*, alſo CASP. *à* REJES, *Camp. Elyſ. jucund. Quæſtionum, quæſt.* 2. *n.* 12. & *quæſt.* 83. *n.* 13; alſo LANG. *Epiſt. Medic. Libr.* 1. *epiſt.* 56. & *Libr.* 3. *epiſt.* 6. as alſo the LEXICOGRAPHERS and others. As for the *modern Nepenthes* of the *Indians*, ſee KÆMPFER *Amœnitat. Exot. p.* 652.

conſiſts of *ſolid* and *not hollow* Fibres, which are compoſed of parts incredibly ſmall and minute, and ſcarce changeable by Fire or Water; as was explained in the PROLEGOMENA, CHAP. IV. and V. The Liquid alſo therein contained, is the fineſt of all, and, if there can be any compariſon made with it, in ſome meaſure like the *Water* produced from the Liquid of the *white* of an *Egg*.

III. EVERY pain therefore is ſome *affection* either of a *ſolid* Membrane, or ariſing from the *contained* Fluid, or from *both*.

IV. ALL *Cauſes* which produce pain, howſoever they may *act* on the Liquids, and *change* them, can never create pain, unleſs their *effect* be ſuch a *change*, as may *affect* the Solids.

V. ALL pain therefore depends on ſome *change* of the *Contacts* in the *laſt Solid* of a Nerve, ſo far as it ſtill contains a Liquid.

VI. ALL pain therefore ariſes from the *action*, which excites ſuch a *motion* in a *laſt* Fibre, which, if it be continued, or increaſed, will neceſſarily *deſtroy* the *continuity* of that Fibre; and this we learn from all hiſtories of pain whatſoever: hence alſo all *great* pain, enduring a long time, has for it's *end* a *rupture* of the Veſſels, and a *deſtruction* of the part; thus from an inflammation at length ariſes a *ſuppuration* and a *gangrene*, and from a nervous pain ariſes an inſenſibility: therefore that *motion* being taken away, the pain is taken away alſo.

VII. EVERY *cauſe* of pain, ſo far as it *acts* upon one Fibre, *acts* only either by drawing, or ſqueezing, or wounding; but if it *acts* on more which conſtitute one *Tube*, then it may be conſidered as *inflating* and *diſtending* this *Tube*: whatſoever therefore creates pain, *does* it only by drawing, or ſqueezing, or diſtending, or wounding.

VIII. All *drawing*, in the *ſoundeſt* Body, excites pain by *prolonging* the Fibres; as we may learn from the *tortures* of Executioners.

IX. That a great *diſtenſion* of the Veſſels, by the contained Liquids, cauſes pain by *prolonging* the Fibres; we learn from the *hiſtory* of *Phyſic*; for this appears from *painful* tumours, where, the tumour being taken away, the pain ceaſes: it is to be obſerved moreover, that though the *diſtended* Veſſel remains the ſame as to it's length, yet the Fibres of the *ſides* may be prolonged by that *diſtenſion.*

X. All *Vulnerants*, properly ſo called, *operate* either by pricking, boring, or cutting: and ſo long as they *act*, they excite pain by *prolonging* the Fibres; but as ſoon as they have produced the *effect*, the pain ceaſes: hence alſo a Nerve *cut off* has no *pain.*

XI. That *Fire*, and all inviſible *Acrids* act after the ſame manner, as the enumerated cauſes, has been proved in the hiſtory of *Acrids*.

XII. Pain excited in any part is taken away, 1. By *deſtroying* the Nerve in the part where the pain is: now the Nerve is *deſtroyed*, when the Liquid can no longer *flow* into it. 2. By *intercepting* the communication of the *motion* exciting the pain with the common *ſenſorium.* 3. By rendering the Brain *unfit* to receive the communication of the *dolorific cauſe*; as appears from *apoplectic* Perſons, and all thoſe whoſe Brain is *compreſſed* by any cauſe.

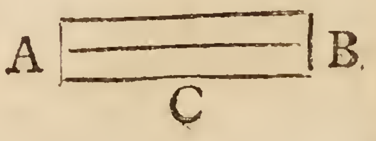
XIII. The *loweſt* and *mildeſt* pain of one laſt *Fibrilla* ariſes from any *motion* a little *larger* than uſual, impreſſed on the *Fibrilla*; the *end* of which is a *moſt pleaſing ſenſation:* which, ſo far as it is cauſed by a *gentle vellication*, is called *Titillation*; but when by a *corroſion* of the contained Liquid, it is called *Itching*: thus the *moſt pleaſant* ſmell and taſte, if they are perceived a long time and vehemently, excite pain, it is the ſame alſo in ſounds.

XIV. The *greateſt* and *moſt vehement* pain of one laſt *Fibrilla* ariſes from a *prolongation* of it a long time continued, as near as poſſible to *diſſolution*, but yet without *diſſolution*.

XV. But the *greateſt* increaſe of pain ariſes from a *number* of the *Fibrillæ* being affected together; for *two Fibrillæ* ſo affected do not excite ſo great a pain, as if *more* were affected together.

2. From what has been ſaid therefore it is manifeſt that all pain ariſes from a *diſtraction*, or too great a *prolongation* of the Fibres: which if it proceeds from an *external* cauſe, may be removed by the *taking away* of that cauſe: but if it ariſes from an *internal* cauſe, we muſt firſt examine what that is, that we may be able to remove pain. Now the *internal* cauſes of too great a *diſtraction* are reduced to *five*; and therefore there are *juſt ſo many* Claſſes of *Anodyne* Medicines, which remove ſuch cauſes.

3. And theſe are the cauſes, 1. A *ſemi-laceration* of ſome Nerve: for that part of a *ſemi-lacerated* Nerve, which remains *unhurt*, ſuſtains a much *greater impetus* or contraction, than in a *ſound* ſtate of a Nerve; whence follows a *diſtraction* or *prolongation* of it. Let us ſuppoſe for example, that A B is a Nerve conſiſting of *three* Fibres, which, whilſt they are *entire* and unhurt, ſuſtain all that *force* together, by which the Nerve endeavours to contract



it's ſelf, and to ſtart back towards the points A B, to which it is affixed: if now *one* of theſe Fibres is broken at C, the other *two* will ſuſtain the whole *force*, which was before ſuſtained by all *three*, and hence they will neceſſarily ſuffer a *diſtraction* and pain. 2. Too great an *inflation* from a Spaſm. 3. Too great a *diſtenſion* from ſome obſtruent, and the preſſing of the Vital Power. 4. Too great a *diſtenſion* from the impacting of an Acrid and the preſſing of the Vital Power. 5. A *diſtraction* of the Nerves from their own elaſticity over ſome hard and impacted Body, as over a *Stone* in the Ureter.

4. Those which take away the *firſt* cauſe are, 1. An entire *diſciſion* or *burning* of a *ſemi-lacerated* Nerve: in this ſenſe therefore Knives, Fires, and potential Cauſtics are the greateſt Anodynes. 2. The *drawing* of the *lacerated* parts towards each other: for in the greateſt pains theſe are often of wonderful ſervice, as we find by experience; for a *wounded* Muſcle is in pain, ſo long as it *gapes*, but when the parts are *drawn* to each other, the pain ceaſes: hither therefore belong *Suction*, *Ligatures*, *Sutures*. 3. The *ſoftening* and *relaxing* of the whole Nerve, which cauſe the *unhurt* parts of the Nerve to be protended in length without pain: hither therefore belong all *Relaxers* and *Emollients*; ſuch as (α) warm *Water*. (β) A light *mixture* of one part of *Vinegar* and three of Water. (γ) Mealy, oily, *emollient Decoctions*, applied in form of a Plaſter, Fomentation, Vapour, Cataplaſm, or Bath. (δ) A large *draught* prepared of the *like*. (ε) All the mildeſt *Balſamics*; as *Balſam of Peru*, *Gum Elemi*, *Turpentine*, *&c.* diſſolved in the yolk of an Egg, and applied ſo as to pene-

trate to the affected place. (ζ) *Parts* of *Animals* newly killed applied *warm*; for thus it is accounted a great *Anodyne*, if, for example, an injured Arm be put into the Abdomen of an Animal newly killed. 4. Laſtly the *firſt* cauſe is removed, if the parts near the Wound be ſo changed by any thing, as to *harden* and *ſpring back*, and thereby perfectly *diſſolve* the *ſemi-lacerated* minute parts: but ſuch a change is effected in the parts near the Wound by *Oil of Turpentine* and *Alcohol of Wine* poured on warm, and ſuch like; which indeed, during the action, always produce a very great pain. Moreover if a pain ariſes any where deep in the Body from a *ſemi-laceration*, there is no hope of a *cure*, unleſs the pain being increaſed, the *injured* Nerves are at length entirely *diſſolved*: for thus if ſuch a pain is in the Ligaments, it cannot be taken away unleſs the Nerve be *deſtroyed*, which being performed, the pain immediately ceaſes; hence in a *tophaceous* Gout, there is hardly any pain.

5. THOSE which take away the *ſecond* cauſe are ſuch as remove the cauſe of a *Spaſm*: now the cauſe of a *Spaſm* is either in the Brain, or in a Nerve, or in the muſcular *Villi*; and it is always either an *irritating Acrid*, or an *unequal determination* of the Animal Spirits: the chief remedies therefore in theſe caſes are, 1. Attenuating and diluting drinks, which are oppoſite to the *Acrid* that *irritates* taken plentifully. 2. An *increaſe* of the motion of the Liquids.

6. THOSE which take away the third cauſe are, 1. Thoſe which correct the *impacted Acrid*; by changing it's *acute* figure into an *obtuſe* one: and this is done, (α) By compounding the *Acrid* with other particles. (β) By breaking it's *point*, either by boiling or ſuppuration. (γ) By involving it with *demulcents*. 2. Thoſe which draw out the

impacted Acrid: ſuch as, (1) Thoſe which relax the paſſages; hence HIPPOCRATES ſaid, that every *pain* ariſing from an *Acrid* ſhould be relaxed. (2) Thoſe which dilute the Liquids. (3) Thoſe which determine it *outwards* (ſee the CHAPTER of *Drawers*). (4) Thoſe which draw down the *impacted Acrid* to *reſt*: now it is compoſed to *reſt* by *four* ways; (α) by diminiſhing the *impetus* of the circulating Liquids, and contractile Solids; for unleſs the *infixed Acrid* was compreſſed by the *contractile force* of the Solids, and by the *projectile force* of the Fluids, it would not produce pain: but the *contraction* of the Solids is diminiſhed by *relaxing*; and the *impetus* of the Fluids is diminiſhed by bringing them nearer to the ſtate of *death*, or approaching to *death*; hence alſo all pain ceaſes a little before death (ſee the CHAPTER of *Siſtents*). (β) By determining their *impetus* another way (ſee the CHAPTER of *Drawers*). (γ) By cauſing faintings. (δ) By taking away the external cauſes, which by their action *excite* the *Acrid*, which of it's ſelf is unactive; ſuch as *heat* and *motion* of the part.

7. THOSE which take away the *fourth* cauſe are ſuch as relax the Veſſels, reſolve an *infarction*, and diminiſh the *projectile force* of the Liquids: hither therefore belong *bleeding*, any *great evacuation*, alſo *inciding*, *attenuating*, *reſolving*, *diluting Medicines*; ſuch as *Baths*, *Fometations*, &c.

8. THOSE which take away the *fifth* cauſe are, 1. All that take away the *firſt*. 2. Thoſe which move and propel what is *impacted* by gently lubricating, reſolving and ſtimulating. 3. Thoſe which determine what is *impacted* to the place where it does leaſt hurt: (ſee the CHAPTER of *Drawers*).

9. MOREOVER if the pain is great, and we are not able to remove the cauſe, then the pain becomes

comes it's own *cure*, namely by deſtroying the Man: but yet there are ſome things which, though they do not take away the *cauſe* of pain yet diminiſh the *ſenſe* of it; ſuch as *Hypnotics* or *Soporifics*.

10. All *Hypnotics* may be reduced to the *two* following Claſſes.

I. The *firſt* Claſs contains whatſoever procure *ſleep*, by taking away the impediments of *ſleep*: and theſe impediments for the moſt part are *external objects*, *pains*, *heats*, *ſweats*, *various diſeaſes of the Body*, *and paſſions of the Mind*; which being taken away, *ſleep* follows of it's own accord: by this means therefore almoſt all Medicines, as *Diluents*, *Reſolvents*, *Incraſſants*, *Moiſteners*, *Dryers*, *Heaters*, *Coolers*, *Acids*, *Alkalines*, and innumerable others, and quite contraries, become *Hypnotics*; according as they remove or mitigate this or that ſymptom, by which *ſleep* is hindered: for thus *terreſtrial Abſorbents* often produce *ſleep* in Infants, affected by pain in watching, becauſe of the *Acid* contained in their Stomach and Inteſtines: thus therefore *Roſes*, *Willow*, *Lettuce*, *Dandelion*, *Endive*, *Sorrel*, *Melons*, *Pompions*, *Cucumbers*, *&c.* being applied externally and internally in hot diſeaſes procure *ſleep*.

II. The *ſecond* Claſs includes thoſe which procure *ſleep* by ſuppreſſing the natural cauſes of *watchings*, and in the firſt place by hindering the *flux* of the Liquid through the Nerves: and theſe are of *three* ſorts; 1. *Mild* and ſafe. 2. *Strong* and dangerous. 3. *Hurtful*, and almoſt mortal. *Mild Soporifics* are thoſe which produce a natural, light, and eaſy to be diſſolved *ſleep*; ſuch as *Saffron*, all the parts of the *wild Poppy*, as the *ſeed*, *leaves*, *heads*, *juice*; alſo *white Poppy*, *Hound's-tongue*, in all it's parts, *common Nightſhade*, and that mild

Soporific called *Herba Paris*, *&c.* The *ſtrong* are thoſe which bring a forced, deep ſleep, hardly to be ſhaken off, together with a great *ſtupor:* and theſe, as well as the following, are properly called *Narcotics.* Hither belong *Opium*, *Henbane Seed*, &c. The *hurtful* are thoſe which produce a moſt profound *ſleep*, generally ending in *death*; if this happens to be ſhaken off, there follows a *depravation* of all the faculties of the mind: hither belong the *leaves*, *flowers*, *fruits*, *roots and juice* of both ſorts of *Henbane*; alſo the ſeeds of *Stramonium* or *Thorn-Apple*, which being taken to ʒß cauſes *madneſs*, but ʒj of it is mortal (*a*); alſo the

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(*a*) The *ſeed* of the *Stramonium fructu ſpinoſo* or *Datura*, reduced to powder, and given to ʒß in drink, diſturbs and diſorders the *mind*, cauſing a ſort of *madneſs*, that laſts four and twenty hours. The unhappy Perſon who has taken this *ſeed*, remains for a long time, as it were diſturbed in *mind*, either laughing, or howling, or ſleeping, and generally talking with another Perſon, or anſwering him; ſo that ſometimes one would think him to be in his *right mind*, though at the ſame time he is *out of his ſenſes*, and does not know the Perſon with whom he converſes, and quite forgets the converſation, after he is comes to himſelf. Hence as GARCIAS AB HORTO relates, the flower and ſeed of *Datura* is put by Thieves into the *food* of thoſe whom they would *rob*; for thoſe who have taken this Drug, are *out of their ſenſes* for ſome time, they ſuffer themſelves to be *robbed* of any thing with great freedom. CHR. ACOSTA alſo relates, that ſome *Indian* Women know how to prepare this poiſon in ſuch a manner, as to diſorder the *ſenſes* for a *certain* number of hours, more or leſs, according as they have a mind. And ſome Writers of Travels affirm, that *adulterous* Women frequently make uſe of this trick, to deceive their Huſbands See more in GARCIAS AB HORTO, *Libr.* 2. *cap.* 24. *&* CHR. ACOSTA *p. m.* 301. *& ſeq.* or in RAY, *Hiſt. Plant. page* 749. In the laſt place ſee KÆMPFER concerning a certain *magical Electuary*, as he calls it, compoſed of *the ſeed of Datura*, *Opium*, *meal of Perſian Hemp*, and other things, of which he relates that he had experienced wonders, *Amœnit. Exotic. Faſc. III. Obſervat.* 15. *ſect.* 3. *ſub finem.*

the meal of Darnel, the ſeed of *Oxyſchoenos* (*b*), *deadly Nightſhade*, called alſo *Melanoceraſos* or *Belladona*, the *Fruit* or *Golden Apples* of the *Solanum Pomiferum fructu rotundo* C. B. or *Lycoperſicon* GAL. and ANGUILL. (*c*), the *ſmoak* of *Tobacco* taken too plentifully by thoſe whoſe are not uſed to it; alſo too great a quantity of *Wine*, or of the *Spirits* drawn from it, *&c.* (*d*).

(*b*) *Oxyſchoenos* is the *Juncus acutus capitulis Sorghi* C. B. P. concerning the powers of it's *ſeed* ſee DIOSCORIDES and MATTHIOLUS, *Libr.* iv, *page* 732. *Edit.* BAUH. [It is called in *Engliſh*, *Pricking large Sea-ruſh*, and is found in great plenty on the *Welſh*-ſhoar, in *Merionethſhire*]

(*c*) But yet the *Italians* and *Spaniards* eat theſe *Apples* pickled with *Vinegar*, *Salt*, and *Pepper*; and alſo the fruits of *Mandrake* and *Melongena* are by ſome affirmed to be eaten *ſafely*, as by HERNANDEZ, BELLONIUS, *&c.* though many AUTHORS refer them to that Claſs.

(*d*) To theſe *ſtronger Narcotics* there are yet ſome other *Poiſons* to be referred; as the *Cicuta major* or *common Hemlock*, *Cicuta minor*, *Petroſelino ſimilis*, or *Fool's Parſley*, and the *Cicuta aquatica* GESNERI, or *great poiſonous Water Hemlock*, for which ſee WEPFER, and others of that kind. The ſmell alſo of *Saffron* a long time received has a very *narcotic* and even *deſtructive power*; for it is ſo injurious to the Brain as even to cauſe *death*: a memorable *example* of which is delivered by PETER BORELLUS, *Obſervat Centur.* iv. *Obſerv.* 35. *page m.* 303. In the laſt place all the *Soporific* of N° 2. belong to this *third* alſo, if they are taken in *too large* a doſe, as *Opium*, *&c.*

The Fifth CLASS

Of MEDICINES *operating on the* SOLIDS *and* FLUIDS *together.*

The only CHAPTER.

Of ANTIDOTES.

1. AN *Antidote* or *Alexipharmic* is called in *Latin Antidotus*, *Antidotum*, *Alexipharmacum*, *Alexicacum*, *Alexiterion* and *Theriaca*; and all theſe names denote the ſame kind of Medicine, namely, *one that is good againſt Poiſon.*

But before I treat of *Antidotes*, I ſhall premiſe ſome *general* Theorems concerning *Poiſons.*

I. *THAT is called a Poiſon, which ſuddenly cauſes death, by ſome ſingular power.*

II. *DEATH* is cauſed by *taking away the circulation* of the Blood from the Heart into the Lungs and Cerebellum, and from them into the Heart again.

III. Now this *circulation* may be *taken away*, 1. By taking away the moving powers. 2. By *corrupting* the Liquids. 3. By *deſtroying* the Veſſels. 4. By *doing* all theſe three together.

IV. The moving powers cannot be *taken away*, unleſs the Solids and Fluids are *corrupted:* now the Liquids conſidered by themſelves cannot *offend*, ſo as to deſtroy the moving forces, but by going into a *coagulum*; now a *coagulum* is made either in the Veins by what is *taken in*, or in the pulmonary Veſſels by what is *inſpired*; ſee the CHAPTER of *Coagulaters:* but the Veſſels are *deſtroyed*, either as they are *corroded* by an *Acrimony* brought upon the contained Liquids by *Poiſons*, or as they are too much *ſtraitened*; now ſuch a *ſtraitening* is cauſed in the pulmonary Veſſels by the *ſmoak* of Sulphur, *&c.*

V. Thus therefore whatſoever greatly *conſtringe* or *corrode* the *ſmalleſt* Veſſels, being applied either externally or internally, or *coagulate* the Liquids, are Poiſons: and if theſe produce their effects *ſuddenly*, they are called *violent Poiſons*; but if they operate *ſlowly*, they are called *ſlow Poiſons*. And moſt of theſe exert their *power*, by diſturbing the circulatory, ſecretory, and excretory motion, alſo the motion of the *Spirits*, by cauſing Spaſms.

VI. Hence all *ſimple Poiſons* may be reduced to *three* Heads; 1. To thoſe which *conſtringe* or *corrode* the Veſſels. 2. Thoſe which *coagulate* the Liquids. 3. To thoſe which *diſturb* the beforementioned motions. But from theſe *ſimple Poiſons* the *compounds* may eaſily be drawn.

2. From what has been ſaid it appears, that *Antidotes* ought to be ſuch as may either *correct* the *Poiſon*, or *expel* it, or *fortify* the Veſſels, or *reſtrain* Spaſms.

3. But now the *Antidotes* which correct *Poiſons*, operate either by aſſuaging, or by removing the force of the *coagulum*, or by reſolving it. Thoſe which *expel* it, do it either by the help of the

circulatory motion, and thus *warm Water* drank with *Vinegar* and *Salt*, on account of it's increaſing the *motion*, and exciting *ſweat*, is the beſt *Alexipharmic*, or by drawing out of the Body; ſee the CHAPTER of *Drawers*. Moreover the Veſſels are *defended* by mild, glutinous, oily and ſaponaceous Bodies; ſee the *Emollients*, *Lubricaters*, and *Demulcents*. Laſtly, An *Impetus* in the *nervous Syſtem*, or Spaſms are reſtrained by all that have been enumerated, and alſo by *Opiates*; hence alſo *Venice Treacle*, *Diaſcordium*, and other *Alexipharmics* uſe to be compoſed of ſtrong Sudorifics, Gellies, Demulcents, *&c.* mixed together with Opiates.

4. ALL *Antidotes* may be reduced to the *two* following Claſſes.

I. THE firſt Claſs includes the ſimple; and theſe are taken, 1. Firſt from Animals: as the *Fleſh* and *Salts* of all *venomous* Animals; alſo *Oils* prepared with their *Fleſh* by infuſion; and the *Stones* or concreted *Calculi* of *venemous* Animals: hither alſo belong HELMONT's *Lozenges of Toads*, ANDROMACHUS's *Lozenges of Vipers*, and the *Lozenges of Serpents:* thus alſo the *Italians* eſteem the *Oils* of *Scorpions*, *Serpents*, *Vipers*, *Toads*, *Frogs*, as great *Alexipharmics*. Hither alſo belong *Drawers* or *Abſorbents:* ſuch as both ſorts of *Bezoar*, the oriental and occidental, the *Lapis Hyſtricinus*, or *Pedra del Porco*, *Lachryma lapidoſa* (*a*), *Crab's Eyes*, *&c.* 2. From Vegetables: namely,

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(*a*) By *Lachryma lapidoſa* underſtand thoſe *ſordes*, which are found in the angles of the Eyes of *Stags*, hardened like *Wax*, of a ſtrong and penetrating *ſmell*. Of the *faculty* of which MATTHIOLUS diſcourſing, *in Comment. ad Libr. II. Dioſcor. page m.* 290. writes, according to SCRIBONIUS LARGUS, "that theſe *ſordes*, both taken inwardly and applied outwardly "are of wonderful ſervice in the *bites* of *venomous Serpents*; "and therefore, according to SCRIBONIUS, that they are di-"ligently namely thoſe which *aſtringe* or *open*, or *aſſuage*; as the Roots of *Angelica*, *Anthora*, or *wholeſome Wolf's-bane*, *Carline-thiſtle*, *Contrayerva*, *white Dittany* or *Fraxinella*, *Swallow-wort*, *Virginian Snake-root*, *Tormentil*, *&c.* the leaves of *Southernwood*, *Carduus Benedictus*, *Walnut*, *Rue*, *Scordium*, the bark and fruit of *Aſh*, *&c.* of which all the preparations are excellent *Alexipharmics*. 3. From Minerals: namely, all *Abſorbents*, as *Boles*, *Earths*, *&c.*

II. THE *ſecond* Claſs contains the *compound Antidotes*; ſuch as the *Theriaca Diateſſarôn* MESUE, which is a great *Diaphoretic*, and very innocent, the *Electuary of the juice of Rue*, *of Bay-berries*, *of Satyrion and of an Egg*; the *Confection of Jacinth* and *Alkermes*; alſo the *opiate Antidotes*, as the *Requies* NICOLAI, the *Philonium Perſicum*, *Romanum*, *&c.* the *Theriaca aucta*, *Diaſcordium* of FRACASTORIUS and of SYLVIUS, the *Mithridate* and the *Orvietan*: which however deceived it's maſter; for he boaſted, that by the help of it he could ſubdue any Poiſon taken inwardly: but when, according to the preſcription of the Phyſicians, he had taken *thirty grains* of *Arſenic*, he died in a ſhort time, notwithſtanding this his Antidote.

COROLL.

" ligently gathered by the *Sicilian* Hunters, and carried about " with them in a girdle." SCHRODER alſo, *in Pharmac. Libr. V. Claſs I. Art.* 17, *n.* 7, mightily commends them for many diſeaſes; and they are ſaid by other AUTHORS alſo, to be an *Antidote* againſt *Poiſons* and *venemous diſeaſes*, preferable to the treaſures of Kings. Conſult FREDER. HOFMAN, *in Clav. Schrod. ad dictum locum*, alſo REJES, *Camp. Elyſ. Jucund. Quæſt. quæſt.* 67. But ETMULLER refuſes to give credit to any of them, in his SCHROD, *Dilucid. ad dict. loc.* affirming, " that it is a Fable of the Ancients that " theſe *tears* are *alexipharmic*, and that they are of no uſe in " Medicine" But however it is, the uſe of them at preſent ſeems to be quite aboliſhed.

COROLL. FROM what has been ſaid it appears, that there are no *general Counterpoiſons*, nay and that it is repugnant, that there ſhould be any ſuch; but that Medicines become *Antidotes*, as they produce this or that different effect in our Bodies (*b*).

(*b*) The Reader will find a larger and better account of *Poiſons* and their *Antidotes*. in the celebrated AUTHOR's *Inſtitut. Med. ſect*. 1119, *&* *ſeq*.

TWO
EPISTLES:
ONE OF
Antonio Maria Zanini,
Doctor of Phyſic of *Verona*;
And the other of
CARLO PASINI,
Philoſopher and Doctor of Phyſic,
To the Celebrated
Giovanni Baptiſta Verna,
Phyſician and Patritian of *Lanciano.*

THE *PARIS* BOOKSELLER TO THE READER.

Candid Reader,

I Was favoured with theſe *two Epiſtles*, which I here preſent to you, by the celebrated Petro Antonio Michelotti, during his abode in this *City*, on purpoſe that I might add them to the end of ſome work of the learned Boerhaave, being of great excellence in themſelves, and containing very honourable mention of our celebrated Author, and his works.

To the Learned

Giovanni Baptiſta Verna,

Doctor of Phyſic and Patritian of *Lanciano*,

Antonio Maria Zanini,

Doctor of Phyſic of *Verona*,

Sends Greeting.

Learned Sir,

LORENZO BASILIO has without difficulty conſented, and acquieſced in your excellent advice, ſo often communicated to me in your letters; and has readily acquitted himſelf of the promiſe, which he made you, and that with a larger intereſt than you yourſelf required. He has made a collection of all the works of your favourite HERMAN BOERHAAVE, and committed them to the Preſs; and has added beſides, at the end, ſome inaugural orations, which before were ſcattered about, like the *leaves* of the *Sibyll.* He is a very nervous and ſolid Author, not trifling about words or ſyſtems, but touching only the Nerves of Science, like another VERULAM, and ſhews ſufficiently that he is a Man of much ſtudy and labour. If any thing occurs to you, you will be pleaſed to lay your commands upon me: the learned world will owe to you, that BOERHAAVE appears in public, in an *Italian* dreſs; and the *Dutch* will own their obligations to you, for having taken ſuch care of the glory of their Countryman. Add to this, that in the foreign editions, if you except the *Leyden* one, this great Author appears lame, mutilated, and in an ill dreſs. You aſk me about the courſe of my ſtudies? truly I am generally pretty earneſt, only a fit of idleneſs ſometimes ſteals upon me. I am wholly engaged upon EROTIANUS, whom I have crouded with ſo many new and obſolete words of HIPPOCRATES, that he is grown inſenſibly into a vaſt bulk. HESYCHIUS went before me, according to the advice of my SCALIGER; and VALERIUS ſhewed the way to HARPOCRATIUS, taking words from ISOCRATES, HERODOTUS and THUCYDIDES, who were of the ſame age with HIPPOCRATES, PHILIP MAUSACUS of *Aix*, and HENRY VALESIUS of *Paris*, being my Guides and Maſters. Is it not evident that CORNARIUS, if you conſider him well, rather ſteals from FUCHSIUS, than interprets? And that FOESIUS does not always give us the true *Latin* of HIPPOCRATES? For what elſe is *in Perfrigeratis* 'Επανεν ἔνχαντες? and *in Pulmoniacis* Φωῖδες? and innumerable others? but this only by the by. I have brought the *occulta Acutorum funera* to perfection, not without great labour; but I had rather my works ſhould periſh with me, than caſt ſuch things before the ignorant and ſquabbling pretenders. The Dogs bark on my right Hand and on my left, to make uſe of the complaints of ÆNEAS SILVIUS in his Epiſtles. It is better for me to ſing to my good genius and the Muſes in my own ſtudy, than to be expoſed to the biting of mad Dogs. You are curious to know what I think about our Phyſicians, who practiſe in this moſt populous city ? I will tell you freely. The greateſt part of them, to ſpeak in one word with ARISTOPHANES, ἀεροβάτει, and really Νεφέλας ξένει : they compoſe, labour and delight in their *hypotheſes* in their own ſtudies; and adhering to *ſyſtems*, reduce very few things to practice from the dictates of nature, quite abhorring our ANCIENT FATHERS: their deſks reſound and thunder out *machines*, τεχνολογίσματα, *ſtructures* and *ſchemes*. Theſe however are tolerable ; but the other is intolerable, with EURIPIDES,

——Κεῖνο δὲ ȣ̓κ ἀνασχετὸν
Ἐῖαειν ὀδȣ͂ χαλῶντα τοῖς κακοῖσιν.

S. RINALDO DULIOLI, being tied to both by a common link of friendſhip, the late profeſſor of *Padua*, a great friend of BOERHAAVE, whilſt he lived in *Holland*, often conſulting with him about the moſt weighty affairs, went a few days ago to *Bologna*, taking leave of HYGIA, APOLLO, and our troubles and labours, much to the grief of all, being himſelf filled with riches and honours : what can we now hope for, when he is gone, and has *fore-ſworn the medical Muſes ?* he deſired me to ſend you his compliments, and to tell you that he wiſhes you all proſperity. We have a long time been impatient for your lubrications *de Viventium MedicorumFatis*, which you have ſo often promiſed both publickly and privately, of which we have the greateſt expectations. But it is time to conclude. May you enjoy all happineſs, and not fail to oblige me with a frequent correſpondence, though ſo great a ſpace both of ſea and land is interpoſed between us.

Venice, April 1, MDCCXXII.

To the Learned

Giovanni Baptiſta Verna,

Phyſician and Patritian of *Lanciano*,

CARLO PASINI,

Philoſopher and Doctor of Phyſic,

Sends Greeting.

YOU have been informed by the letter of ANTONIO MARIA ZANINI that I congratulate you on the new edition of the famous HERMAN BOERHAAVE's Phyſical Works, which has lately been publiſhed by LORENZO BASILIO our Bookſeller, according to your advice. But I cannot help being grieved, that BASILIO, in printing theſe Works, did not aſk the adviſe and aſſiſtance of ſome excellent Gentlemen, who profeſs the rational and true Phyſic, in this noble city. For as the Maſters of this *ſcience of healing* are able both perfectly to underſtand, and clearly to explain theſe *Phyſical Works* of BOERHAAVE, you your ſelf LEARNED SIR, cannot but know, that they could have added to the *Baſilian* edition, of which I am ſpeaking, a preface concerning the excellence and uſefulneſs of BOERHAAVE's writings; and alſo ſome annotations, that would have been of the greateſt ſervice to ſuch young men, as deſire to learn the doctrines of that learned WRITER, and at the ſame time would have done honour to the AUTHOR himſelf. And that you may plainly ſee there are moſt noble Phyſicians in this our famous city, who could eaſily have done what I mention, I muſt deſire you to obſerve, that the greateſt part of them are accuſtomed diligently to examine, by experiments and juſt obſervations, what nature can do or ſuffer, both in a good and bad ſtate of health, which the MASTER has ſhewn in *diſeaſes*: and that they are accuſtomed alſo to reduce all the powers, motions, and actions of our Bodies, and all the faculties and operations of *Medicines* to rational Mechanics, by the aſſiſtance of an exact Anatomy, experimental Chemiſtry, and art of computing. Of this let GIACOMO BRACHI, BERNARDINO ZENDRINI, DOMINICO SANOTORINI, HIERONIMO ODDONI, LEONARDO DORO, GIUSEPPO GRANDIS, ANDREA ROSSETTI, GIACOMO MARCHI, Men famous for the knowledge of Phyſic and Eloquence, be my Witneſſes: I call to witneſs alſo (to paſs over other Perſons of great merit, for brevity ſake) PEDRO ANTONIO MICHELOTTI, who in his laſt publiſhed work, *de ſeparatione Fluidorum in Corpore Animali*, and in his Animadverſions on the moſt learned Doctor JAMES KEILL's *fifth Eſſay on Muſcular Motion*, has laid the chief foundations of the *Apollinean* art, grounded on a ſound Anatomy, and ſublime Mechanics: by the help of which who can deny, that many things which are laid down as *data*, by the moſt ingenious BOERHAAVE, in his *Inſtitutiones Medicæ*, but not demonſtrated, and belonging to the motion of the

Heart, Blood, and Muſcles, to the Reſpiration, to the Preſſures, Velocities, Fluidities and Secretions of the Liquors, and to the Animal Spirits, may be eaſily demonſtrated? eſpecially of thoſe who know how to compare the excellent diſcoveries of the above-mentioned Philoſophers. If you conſider all theſe things attentively, and judge them ſincerely, I do not doubt but you will immediately confeſs, that this Greekling ZANINI has written to you unjuſtly, and with a liberty not to be born, though veiled a little with *Greek*, *that the greateſt part of our Phyſicians tread in the Air*, *and catch at Clouds*, *and exhibit ſubtile diſputations*, *or niceties to their Auditors*, *that are fit only for their own deſks*: and that *they recal but few things to practice from the dictates of nature.* To ſuch a Man belongs Βοιώτειον ȣ̃ς; or rather Ἀθηνᾶς ψήφος. Nay ſince he pretends, that *we quite abhor the ancient Fathers*, I beg you would conſider, whether it is he, or we that moſt obey the precepts of HIPPOCRATES. For we diligently obſerve what HIPPOCRATES recommended to *his Son* THESSALUS, Ιϛορίης δὲ μελέτω σοι, ὦ παῖ, Γεωμετρικῆς, ϗ Ἀριθμήσιος, *&c.* that is, *Be very ſtudious, my Son, in the knowledge of Geometry and Numbers. For they will not only render your life illuſtrious, and fit for many things in the ſtate of human affairs: but will alſo cauſe your mind to be more quick and clear, in obtaining the advantage of all thoſe things, the uſe of which is required in Phyſic.* ZANINI on the contrary, condemns theſe and ſuch like, and makes a ſtrange exclamation, forgetting what is written by the ſame HIPPOCRATES, in his Epiſtle to DIONYSIUS; Ἐγὼ δὲ εἶμαι ȣ̓δὲ νόσον αὐτὴν εἶναι, *&c.* that is, *I do not think that to be a diſeaſe, but immoderate learning, which indeed is not immoderate, but thought ſo by the ignorant, for immoderate virtue* *is never hurtful. For the excellence of a diſeaſe raiſes an opinion of it's ſelf, becauſe of the ignorance of thoſe who judge of it. For every one judges that to be ſuperfluous which abounds in another, and is wanting in himſelf. For thus the coward thinks fortitude to be impudence, and the covetous Man has the ſame opinion of magnanimity.* But *do we recall but few things to practice from the dictates of nature!* What? is it not the moſt perfect genius of nature, if any one buys a like ZANINI? ſo ſay the popular Empirics. And if you ſhould know that ſome of theſe being accuſtomed to weigh even the wiſeſt opinions of Phyſicians by unſucceſsful events, have raſhly pronounced, more than once, both here and in other places, before ingenious Doctors of Phyſic, that the moſt experienced BOERHAAVE is generally miſtaken in weighing and conſidering the diſorders of the human Body, you would be aſtoniſhed, that ZANINI ſhould reckon them among thoſe who are the moſt fond of BOERHAAVE. But as the confidence of thoſe Empirics has been an offence to all who know the great excellence in practice of that wonderful Man, confirmed by the moſt eſtabliſhed reputation, both among his own People, and in foreign Nations; ſo none can help laughing at thoſe words in the *Baſilion* Epiſtle: HERMAN BOERHAAVE *being now brought over from* Holland, *implores your favour and protection:* as if the works of BOERHAAVE were now firſt imported into *Italy*, or as if it became ſo great an AUTHOR, who has been long approved by the moſt learned and moſt famous *Italians*, and often juſtly and deſervedly commended in printed Books, to fly for refuge and protection, as a ſuppliant, to a Phyſician of ſuch a rank. In the laſt place I would inform you, moſt learned VERNA, that when I lately made mention to the *Fellows* of the moſt illuſtrious College of *Venetian* Phyſicians, of good ZANINI'S lamenting his misfortune, and pitying the common danger of our Patients, who are deprived of that great Phyſician, the Seniors could ſcarce refrain from laughing, and the Juniors burſt into a loud laughter, or to uſe the words of PERSIUS,

> *Ingeminaſſe*
> —— *Tremulos naſo criſpante cachinnos.*

Venice, April 24, 1722.

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